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# Housing and Household Equipment Research in Home Economics 1925 - 1950

By Helen E. McCullough

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### Foreword

This study was sponsored originally by the Research Committee of the Housing Division of the American Home Economics Association in 1947-1949. The Housing Committee of the Home Economics Research Section of the Association of Land-Grant Colleges and Universities also contributed to the study in 1949. The author, who participated in the work of these committees, expanded the scope of the investigation and prepared this report. Both committees approved the use of their data by the Illinois Station.

Acknowledgment is given to Tessie Agan who, as chairman of the Research Committee of the Housing and Household Equipment Division of the American Home Economics Association for 1947 to 1950, assisted with the collection and analysis of the data originally assembled and checked the final manuscript; and to Deane G. Carter and Maud Wilson for reading the manuscript. Appreciation is expressed to those persons in the contributing institutions who generously gave of their time in supplying and checking data used in the analysis.

# HOUSING AND HOUSEHOLD EQUIPMENT RESEARCH in Home Economics: 1925-1950

By HELEN E. McCULLOUGH, Assistant Professor of Home Economics

IN THE EARLIEST home economics curricula, housing was included as one of the three major fields of study: food, clothing, and shelter.<sup>1</sup> Research in housing developed slowly, however, and aroused little widespread interest until the passage of the Research and Marketing Act in 1946. This act provided funds for housing research in the agricultural experiment stations at a time when the public was conscious of an acute shortage in dwellings. The need for more scientific knowledge about housing was apparent, and the time was ripe for research on a large scale. Home economists were suddenly confronted with the fact that not only were few of them trained to do such research, but there was little information available about what had been done.

This study was undertaken, therefore, to give an over-all picture of housing and equipment research by home economists completed or in progress during the years 1925 through 1950: when, where, by whom it was done or is being done; the sources of funds; the phases of housing covered; the methods used; and the availability of the findings. In this field of research where facts are wanted quickly and personnel is limited, such information is needed to point up the areas that call for emphasis, to help in classifying and establishing effective procedures for research, and to give guidance in the training and placing of personnel.

## HOW THE STUDY WAS MADE

All colleges and universities in the United States that grant degrees in home economics and the U.S. Bureau of Human Nutrition and Home Economics were asked for a complete list of research studies in housing and in the related fields of home management and household equipment. Only those studies made entirely or in part by home

<sup>1</sup>The course of domestic science as given in the Catalog of the Industrial University of Illinois for the year 1875-76 includes home architecture. The *Lake Placid Conference on Home Economics*, Proceedings 1-10, 1899-1908, lists among the standing committees one on shelter and household appliances.

economists or by persons under the direction of home economists were to be included. A form was provided for the information requested. Subsequent letters were sent to institutions not answering the first letter until replies were received from all.

The resulting list of studies and projects was cross-checked with the following sources to insure completeness:

*Active and Completed Projects in Housing and Household Equipment Division of the Bureau of Human Nutrition and Home Economics.* August, 1949. Lists all research pertaining to housing and equipment carried on at the Bureau from 1927 to 1949.

*Theses Completed in Family Economics and Home Management or by Persons Active in These Fields: 1920-1949.* Prepared by the Family Economics, Home Management Division of the American Home Economics Association. Some of these studies pertain to housing or closely related fields and are listed in the present report. Most of the studies were unpublished.

*Bibliography of Agriculture.* Published monthly by the U.S. Department of Agriculture Library.

*Experiment Station Record.* Published twice yearly up to 1946 by the U.S. Department of Agriculture. The studies pertaining to housing and household equipment were checked for this report.

The studies from the above sources were carefully screened for those actually pertaining to or having a direct bearing on some phase of housing. This was particularly true for those in home management and household equipment. Because research in household equipment has not previously been listed in one place, as have studies in management, the complete list of equipment studies is reported separately in Part II of this publication.

The questionnaire called for a descriptive title of the study; the date; the name of the researchers; whether experiment station, state, or student research; the source of the funds; subject matter; type of research; and the kind of publication which resulted. Data were classified and summarized under these headings. Findings were interpreted and returned to the respective institutions for verification, additions, and corrections at least three times in order to make this report as complete and accurate as possible.

Obviously difficulties were encountered in assembling and interpreting data from so many varied sources and covering so long a period. Staff changes made it hard to obtain complete and precise information in all cases. Also the lack of an objective criterion for evaluating research increased the difficulty of making decisions regarding the many points considered. Those who submitted the data and those who did the analyzing were responsible for final decisions. The possibility of error was minimized by the frequent return of the data to the insti-

tutions for rechecking, and by comparing their listings with published lists, abstracts, and reports.

It is to be expected that the studies considered vary widely in value, even as they do in subject matter and method of research. Approximately half are graduate theses, special problems, or limited studies not sponsored by a regular research agency such as the experiment stations. Fewer than half the studies have been published.

Despite the fact that some of the studies have been limited, fragmentary, and obviously exploratory, their recording in one place should help to prevent duplication of research in the future and suggest fields for further investigation.

## PART I: HOUSING RESEARCH

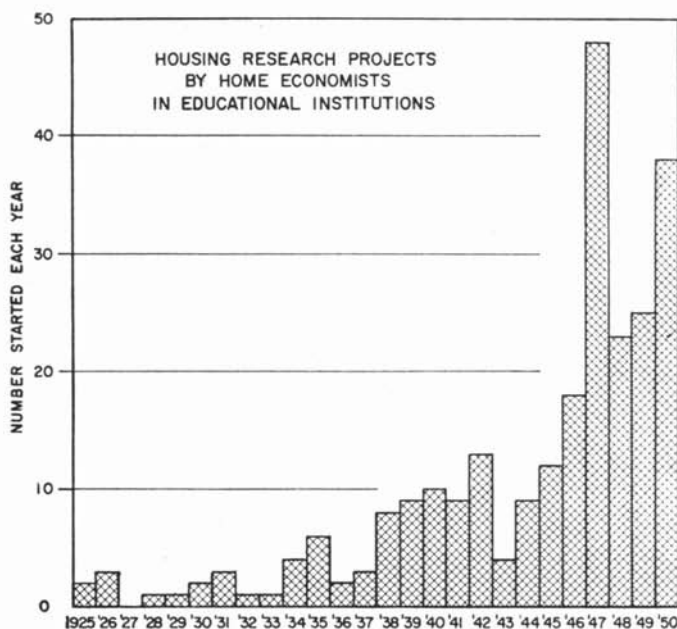
### Development of Interest

During the twenty-six years from 1925 through 1950, the 255 research studies in housing reported here were undertaken by home economists in American colleges and universities and in the U.S. Bureau of Human Nutrition and Home Economics. Over half of these were underway during the four years from 1947 through 1950.

Two events, the President's Conference on Home Building and Home Ownership in 1931 and the Research and Marketing Act in 1946, were noteworthy for their influence on housing during these twenty-six years. After the President's Conference home economists were more conscious of the possibilities of housing as a subject in the home economics curriculum and of the research needed. Their interest is reflected in the large number of articles on housing published in the *Journal of Home Economics* during the years 1934 to 1937.<sup>1</sup> Research, however, grew slowly until the passage of the Research and Marketing Act in 1946. The great increase in the number of research projects in the land-grant colleges following 1946 is evident in the graph shown in Fig. 1 and the data in Table 1.

In 1925 two studies that could be classified as housing research were made at the University of Nebraska. From 1926 to 1934 no more than three studies were started in any one year, and six were reported in 1935. By 1942 the number of new studies reached a high of 13, then declined until 1946. In 1947, as a result of the Research and Marketing Act approved the previous year, the number of new projects increased to 48. A "farm housing study" undertaken cooperatively by a large number of the agricultural experiment stations and the Bureau

<sup>1</sup> See references in: WILSON, MAUD, The scope of housing in home economics, *Jour. Home Econ.* 29 (6). 1937. NICKELL, PAULENA, The home economists' part in the field of housing, *Jour. Home Econ.* 30 (4). 1938.



The slow, uneven growth of housing research before 1946 contrasts sharply with the remarkable upsurge following the passage of the Research and Marketing Act. (Fig. 1)

of Human Nutrition and Home Economics accounted for most of the new projects. Twenty-three new projects were begun in 1948, 25 in 1949, and 38 in 1950.

Not only was there a great increase in the number of housing research studies after 1946, but the cooperative nature of many of the projects called for definite research programs. For the first time serious attention on a wide scale was given to research procedures and methods. The years preceding 1947 may therefore be said to cover the preliminary and exploratory period of research. It is logical to expect the years that follow 1947 to be characterized by an increasing emphasis on the scientific approach to housing research.

### Types of Institutions Where Research Was Done

Thirty-eight land-grant and ten other colleges and universities are represented in the housing studies reported here. Also two divisions of the U.S. Bureau of Human Nutrition and Home Economics<sup>1</sup> made

<sup>1</sup> Although the Bureau of Human Nutrition and Home Economics is thought of as an agency rather than an "institution," for simplification it is included with the institutions.

Table 1.—Number of Housing Research Projects Started Annually, 1925-1950

Year	Total projects	Institution* and number of projects	Year	Total projects	Institution* and number of projects
1925	2	Nebraska 2	1945	12	California, Illinois, Iowa, Kansas, Cornell, Syracuse, Oregon, Rhode Island, Washington, 1 each; BHNHE 3
1926	3	Chicago, Nebraska, Ohio St. U., 1 each	1946	18	Purdue, Nebraska, Clemson, Rhode Island, 1 each; Oregon, BHNHE, 3 each; Cornell, Washington, 4 each
1927	0	.....	1947	48	Alabama, Arizona, California, Colorado A. & M., U. Colorado, Connecticut, Georgia, Chicago, Kansas, Louisiana, Maine, Michigan, Minnesota, Missouri, Syracuse, Rutgers, Ohio St. U., Rhode Island, Tennessee, Utah, Vermont, Virginia Poly., Washington, W. Virginia, Montana, 1 each; Cornell, Oregon, Pennsylvania, Clemson, BHNHE, 2 each; Purdue, Nebraska, Wisconsin, 3 each; Illinois 4
1928	1	Cornell 1	1948	23	Arizona, Colorado A. & M., Georgia, Maine, Mississippi, Montana, Rhode Island, Washington, Wisconsin, 1 each; Iowa, Cornell, Ohio St. U., 2 each; Purdue, Kansas, 4 each
1929	1	Chicago 1	1949	25	Arizona, Arkansas, Illinois, Kansas, Maine, N. Carolina, Ohio St. U., Oklahoma, Tennessee, Texas Tech., Vermont, Wisconsin, BHNHE, 1 each; Montana, Rhode Island, Washington, 2 each; Cornell, Pennsylvania, 3 each
1930	2	Illinois, Oregon, 1 each	1950	38	Alabama, Arizona, Arkansas, Colorado A. & M., Delaware, Georgia, Kansas, Tennessee, N. Texas St. Teach., Texas St. for Women, Vermont, W. Virginia, Stout, BHNHE, 1 each; California, Illinois, Iowa, Cornell, Utah, Washington, 2 each; N. Carolina, Ohio St. U., Oklahoma, Oregon, 3 each
1931	3	Washington 1; Iowa 2			
1932	1	Iowa 1			
1933	1	Oregon 1			
1934	4	Cornell, Vermont, Washington, BHNHE, 1 each			
1935	6	Cornell, Rhode Island, 1 each; Iowa, BHNHE, 2 each			
1936	2	Iowa, Minnesota, 1 each			
1937	3	Ohio U., Oregon, Washington, 1 each			
1938	8	Kansas, Tennessee, Texas St. for Women, 1 each; Cornell 2; Oregon 3			
1939	9	Kansas, Kentucky, N. Carolina, Texas St. for Women, Stout, 1 each; Oregon 4			
1940	10	Missouri, Nebraska, Oregon, Rhode Island, Vermont, 1 each; Texas St. for Women 2; Cornell 3			
1941	9	Tennessee, N. Texas St. Teach., Vermont, BHNHE, 1 each; Virginia St. 2; Oregon 3			
1942	13	Syracuse, Ohio St. U., Ohio U., Prairie View St. (Tex.), U. Texas, Wisconsin, 1 each; Oregon 7			
1943	4	Oregon, BHNHE, 1 each; Purdue 2			
1944	9	Chicago, Illinois, Purdue, Cornell, N. Carolina, Oregon, Wisconsin, 1 each; Syracuse 2			
			Total	255	

\* For more complete names of institutions, see Table 4, page 13. Here, for brevity, only the state is given when only one institution from that state is listed in Table 4.

Table 2. — Number of Housing Research Studies at Each Institution

Institution*	Number of studies	Institution*	Number of studies	Institution*	Number of studies
Oregon.....	32	*Texas St. for Women.....	5	W. Virginia.....	2
Cornell (N.Y.).....	23	Arizona.....	4	*Stout (Wis.).....	2
*BHNHE.....	15	California.....	4	*U. Colorado.....	1
Washington.....	14	*Chicago.....	4	Connecticut.....	1
Purdue (Ind.).....	11	Montana.....	4	Delaware.....	1
Iowa.....	11	Oklahoma.....	4	Kentucky.....	1
Illinois.....	10	Colorado A. & M.....	3	Louisiana.....	1
Kansas.....	10	Georgia.....	3	Michigan.....	1
Ohio St. U.....	10	Maine.....	3	Mississippi.....	1
Nebraska.....	8	Clemson (S.C.).....	3	Rutgers (N.J.).....	1
Rhode Island.....	8	Utah.....	3	*Ohio U.....	1
Wisconsin.....	7	Alabama.....	2	Prairie View St. (Tex.).....	1
*N. Carolina.....	6	Arkansas.....	2	*Texas Tech.....	1
Vermont.....	6	Minnesota.....	2	*U. Texas.....	1
*Syracuse (N.Y.).....	5	Missouri.....	2	Virginia Poly.....	1
Pennsylvania.....	5	*N. Texas St. Teach.....	2		
Tennessee.....	5	Virginia St.....	2	Total.....	255

\* For more complete names of institutions, see Table 4, page 13. Here, for brevity, only the state is given when only one institution from that state is listed in Table 4.

\* Non-land-grant institutions are starred. Studies made in them totaled 43, or 17 percent of all. Land-grant studies totaled 212, or 83 percent of all studies.

contributions to this research — the Divisions of Housing and Household Equipment and of Family Economics. Table 2 shows the institutions carrying on projects.

Two hundred twelve studies, or 83 percent of the total 255, were made in land-grant institutions. This is to be expected because of the availability of federal funds for research in these institutions. Twenty-eight studies were in colleges and universities other than land-grant, and 15 were in the Bureau of Human Nutrition and Home Economics.

### Number of Projects per Institution

The number of projects carried on by each of the 49 institutions that have contributed to home economics housing research is given in Table 2. Twenty-eight, or 57 percent, contributed three or more studies each, accounting for 89 percent of all the research. The other 21 institutions had one or two projects each.

Number of studies obviously is not necessarily related to quality of research. The number that meet experiment station standards, the strength of the graduate program, and number of projects on which results have been published are more important. The character and extent of interdisciplinary research and the availability of personnel with talent for research, factors not considered in this study, would be needed for a true evaluation of the quality of the work done in the various colleges and universities.

However, the institutions which rank highest in number of studies also rate high in these other qualifications. Oregon State College, for



example, with a total of 32 studies, ranks third in number of experiment station studies, first in number of publications among colleges and universities, and has a strong graduate program with the largest number of Master's theses in housing.<sup>1</sup>

As is to be expected, the institutions which rank highest in the various aspects of housing research have been in the field long enough to accomplish certain noteworthy results. Many of the institutions with only one or two studies have entered the research field very recently, most of them since 1946. The work being done by these schools, particularly those carrying on regional cooperative research in agricultural experiment stations, already shows evidence of high standards, development of new methodology, and promise of and provisions for excellent training for the women who are working on the projects.

### Subject-Matter Areas

Housing includes such wide and diverse subjects as design, construction, decoration, landscaping, equipment, economic and legal aspects, community planning, housing for special groups, home management, and family living as related to housing. Many of these are fields of research for the architect, the engineer, or the sociologist. The distinctive contribution of home economists has been in interpreting family needs and applying such interpretation to the design and use of the house. Even when she so limits herself, the home economist has a broad field in housing research.

The various phases of housing research done by home economists fall logically into the following divisions: house planning, home management, economics, home economics education, household equipment, interior decoration, and to a limited extent, sociology, and social economics. These are the divisions used in this analysis.

**House planning.** House planning studies, 182 in number, were varied in content and approach (Table 3). Surveys made on housing needs and preferences and on conditions of houses are included under this heading since their purpose was to obtain data on which to base the improvement of houses.

The 69 surveys, 27 percent of the total housing studies or 38 percent of house-planning studies, made up by far the largest single group.

The studies on requirements of rooms or areas of the house, 48 in number, comprise 26 percent of the total house planning studies. This

<sup>1</sup> This pre-eminence of housing research at Oregon State College is well recognized as due largely to the outstanding work and leadership of Maud Wilson. Miss Wilson states that her work at Oregon was done under a continuous and evolving project from 1930 to 1950. Obviously this "enabling" project covered many studies that would have been organized as short-term projects in other institutions. This type of organization has made it difficult to present clearly or even give full credit for the numerous individual studies made by Miss Wilson.

Table 3.—House Planning, Home Management, and Household Equipment Studies That Apply to House Design

Institution*	Needs, preferences, conditions	Rooms or areas of the house	Other	Total
Alabama Poly.....	1		Storage 1	2
Arizona.....	1	Dining 1, children's needs 1		3
Arkansas.....	1	Living-sleeping 1		2
California.....	1	Arrangement 1	Storage 1, equipment 1	4
Colorado A. & M.....	1	Dressing 1	Environmental 1	3
U. Colorado.....	1			1
Connecticut.....	1			1
Delaware.....			School kitchen 1	1
Georgia.....	1	Kitchen 1, living 1		3
Chicago.....			Management 1	1
Illinois.....	1	Kitchen 1, laundry 1	Management 1, storage 1, school kitchen 1, design 1	7
Purdue (Ind.).....	1	Room use 1, bath 1	Storage 2, plan evaluation 1, remodeling 1	7
Iowa.....	4	Children's needs 1	Design 1, remodeling 1, lighting 1	8
Kansas.....	2	Children's needs 3, dressing 1	Storage 1, home-management houses 1	8
Kentucky.....			Home-management house 1	1
Louisiana.....	1			1
Maine.....	1	Arrangement 1	Storage 1	3
Michigan.....		Room use 1		1
Minnesota.....	2			2
Mississippi.....	1			1
Missouri.....	2			2
Montana.....	1	Sewing 1, bath 1	Environmental 1	4
Nebraska.....	3	Kitchen 1	Management 1, equipment 1, lighting 2	8
Rutgers (N.J.).....	1			1
Cornell (N.Y.).....	5	Kitchen 1, living 1, children's needs 1, sewing 1, ironing 1	Management 5, storage 4, design 1, equipment 1	21
Syracuse (N.Y.).....	1		Management 1, electrical service 1	3
North Carolina.....		Dining 1, children's needs 3		4
Ohio St. U.....	4	Sewing 1	Management 1 <sup>b</sup> , equipment 1, work surface materials 1, lighting 2	10
Ohio U.....			Home-management house 1	1
Oklahoma.....		Sewing 1	Storage 2, design 1 <sup>b</sup>	4
Oregon.....	6	Reading 1	Management 2, storage 4, design 5, plan evaluation 1, electricity 1, equipment 3, school labs 6, home-management houses 2	31
Pennsylvania.....	3	Laundry-sewing 1, children's needs 1		5
Rhode Island.....	2	Living 1	Management 1, floors 3, equipment 1	8
Clemson (S.C.).....	3			3
Tennessee.....	1	Kitchen 1	Storage 2	4
N. Texas St. Teach.....	2			2
Prairie View St. (Tex.).....	1			1
Texas St. for Women.....	1	Children's needs 1		2
U. Texas.....	1			1
Utah.....	1		Storage 1, clothing lab 1	3
Vermont.....	3	Kitchen 1	Management 2	6
Virginia Poly.....	1			1
Virginia St.....	1			1
Washington.....	1	Kitchen 1, laundry 3, kitchen utilities 1	Management 2, design 1, church 1	10
West Virginia.....	1	Business center 1		2
Stout (Wis.).....			Clothing lab 1	1
Wisconsin.....	1		Design 2	3
BHNHE.....	2	Kitchen 1, sewing 1, clothing space needs 1	Equipment 1	6
Total.....	69	48	91	208

\* For more complete names of institutions, see Table 4, page 13. Here, for brevity, only the state is given when only one institution from that state is listed in Table 4.

<sup>b</sup> For the handicapped person.

group includes general arrangement and use of rooms, specific rooms, and space requirements for special activities. The space needs of children are considered in 11 projects; kitchens rank next with 8 studies; 5 are devoted to sewing rooms and 4 to laundries; living rooms have 3; combination rooms, general arrangement, room use, dining rooms, bathrooms, and dressing areas have 2 studies each; reading areas, clothing areas, kitchen utilities, ironing, and business centers are each considered in a single study.

Fifteen projects concern schools, laboratories and home management houses, and one, church kitchens. Twenty are on storage, 12 on design, 7 on lighting, and 3 on floor finishes. Two each are on remodeling, evaluating plans, and environmental influences, and one is on work surface materials.

**Home management.** Only those studies in home management having a direct bearing on housing were included in this report. The 17 studies listed under this subject include motion-time studies on work procedures which might affect room design; studies on house care which might influence the choice of building and finishing materials; and management practices which would affect house design.

Cornell University leads with 5 management studies having a housing application; Oregon, Vermont, and Washington State College have two each; and Chicago, Illinois, Nebraska, Syracuse, Ohio State University, and Rhode Island have one each (see Table 3).

**Economics.** Twenty studies covered various financial aspects of housing. The largest number, 9, were contributed by the Family Economics Division of the U.S. Bureau of Human Nutrition and Home Economics.

The University of Chicago and the University of Wisconsin have 3 each; the University of Illinois, 2; and the University of Arizona, Purdue University, and Kansas State College have one each.

**Home economics education.** The 12 studies included under this heading contribute specific information, aids, or methods for the teaching or the improvement of housing courses and programs. (Studies on the planning of school buildings and laboratories are included under house planning.) Iowa State College, Syracuse University, and Texas State College for Women have two studies each; and the University of Illinois, Purdue University, Cornell University, Oregon State College, Texas Technologic College, and Stout Institute have one each.

The Cornell study on the development of educational instruments for evaluating the choice of a house, which has attracted wide attention, and the present report are examples of research projects included under education.

**Household equipment.** The household equipment studies, 9 in number, listed under house planning have a direct bearing on the design, space requirements, or construction of the house. They consist of studies on the amount of equipment required for certain purposes, which would affect the kind and amount of storage space needed; and the use of equipment for specific activities, which would affect the arrangement of and space required for certain areas of the house. Oregon State College has 3 such studies; the Universities of California, Maine, Nebraska, and Rhode Island, and Ohio State University, and the Bureau of Human Nutrition and Home Economics have one each (see Table 3).

**Sociology.** The 6 studies on the sociological aspects of housing have to do primarily with the effects of housing on people. Two sociological studies each were made at Purdue University and Washington State College; and one each at Texas State College for Women and Virginia State College. Some of these studies touch on psychological influences but no predominantly psychological study appears to have been undertaken in the period covered by this report.

**Interior decoration.** The 5 studies in this field pertain specifically to furniture, which might affect the design and arrangement of the house, and to color, which might influence the choice of finish for a house or its walls. The University of North Carolina and Washington State College have 2 each, and Iowa State College has one.

**Social economics.** Four studies come under this classification. Kansas State College, Cornell University, the University of Tennessee, and the University of Wisconsin have one each. That made at the University of Wisconsin is representative of the group: "The Effects of Income, Tenancy, Family Composition, and Other Factors in Farm House Requirements."

## Types of Housing Research

Research in this report was considered to be the production of verified knowledge in the field of housing through the collection, organization, and analysis of data, with conclusions drawn from these procedures. The *type* of research was determined by the way in which the data had been collected. The methods used in the 255 studies reported show that housing research can be classified as survey, library, case study, or experimental. The experimental in turn is classified according to testing techniques as physical, physiological, or motion-time, the classification followed in Table 4. Other kinds of research may be necessary in the study of some phases of housing,

such as chemical in testing building materials, but were not used by home economists during the period covered.

**Survey.** Approximately 61 percent of all the 255 studies reported were made entirely or in part by the survey method, which consists

Table 4.—Types of Research Used in Housing Studies<sup>a</sup>

Institution	Survey	Library	Case study	Experimental			Total
				Physi- cal	Physio- logical	Motion- time	
Alabama Polytechnic Inst.....	1	..	..	1	..	..	2
University of Arizona.....	2	..	..	2	..	..	4
University of Arkansas.....	1	..	..	1	..	..	2
University of California (Davis).....	1	..	..	3	..	..	4
Colorado A. and M.....	2	1	..	..	..	..	3
University of Colorado.....	1	..	..	..	..	..	1
University of Connecticut.....	1	..	..	..	..	..	1
University of Delaware.....	..	..	..	..	..	1	1
University of Georgia.....	1	1	..	1	..	..	3
University of Chicago.....	1	2	..	..	..	1	4
University of Illinois.....	5	..	..	4	..	1	10
Purdue University (Ind.).....	7	1	3	..	..	..	11
Iowa State College.....	8	..	1	2	..	..	11
Kansas State College.....	8	1	..	1	..	..	10
University of Kentucky.....	..	..	..	1	..	..	1
Louisiana State University.....	1	..	..	..	..	..	1
University of Maine.....	3	..	..	..	..	..	3
Michigan State College.....	1	..	..	..	..	..	1
University of Minnesota.....	2	..	..	..	..	..	2
Mississippi State College.....	1	..	..	..	..	..	1
University of Missouri.....	2	..	..	..	..	..	2
Montana State College.....	2	..	..	2	..	..	4
University of Nebraska.....	6	1	..	1	..	..	8
Rutgers University (N.J.).....	1	..	..	..	..	..	1
Cornell University (N.Y.).....	10	1	1	6	2	3	23
Syracuse University (N.Y.).....	4	1	..	..	..	..	5
University of North Carolina (Woman's College).....	5	..	..	1	..	..	6
Ohio State University (Columbus).....	8	1	..	1	..	..	10
Ohio University (Athens).....	..	..	..	1	..	..	1
Oklahoma A. and M.....	2	..	2	..	..	..	4
Oregon State College.....	16	..	1	14	..	1	32
Pennsylvania State College.....	3	1	..	1	..	..	5
University of Rhode Island.....	2	..	..	6	..	..	8
Clemson Agr. College (S.C.).....	2	..	1	..	..	..	3
University of Tennessee.....	4	..	..	..	..	1	5
North Texas State Teachers' College.....	2	..	..	..	..	..	2
Prairie View State College (Tex.)...	1	..	..	..	..	..	1
Texas State College for Women...	5	..	..	..	..	..	5
Texas Technologic College.....	1	..	..	..	..	..	1
University of Texas.....	1	..	..	..	..	..	1
Utah State Agr. College.....	1	..	..	2	..	..	3
University of Vermont.....	4	..	..	..	..	2	6
Virginia Polytechnic Inst.....	1	..	..	..	..	..	1
Virginia State College for Negroes	2	..	..	..	..	..	2
Washington State College.....	4	..	..	4	..	6	14
West Virginia University.....	1	..	..	1	..	..	2
Stout Institute (Wis.).....	2	..	..	..	..	..	2
University of Wisconsin.....	5	1	..	1	..	..	7
BHNHE							
Housing and Household Equip- ment Division.....	3	..	..	3	..	..	6
Family Economics Division....	9	..	..	..	..	..	9
Total.....	156	12	9	60	2	16	255
Percent.....	61.2	4.7	3.5	23.5	0.8	6.3	100

<sup>a</sup> Whenever a combination of methods was used, the predominating method is indicated.

of securing data through questionnaires, either mailed or used in interviews. An example is the nation-wide survey of rural housing conditions and requirements made with funds provided by the 1946 Research and Marketing Act. This method of research has been greatly improved in recent years by the application of sound statistical principles.

To date most surveys have been limited to rural housing owing to the fact that agricultural experiment stations have federal funds that may be used for such research. Comparable surveys of urban housing are greatly needed.

**Library.** Library research consists of using published material, such as census data, as the source of information for the study. Practically all research involves the review of published material, but only 12 studies are classified in this report as based exclusively on library research.

**Case study.** In case studies data are secured by observing the activities and reactions of one person or a group of persons to specified situations, with no special controls imposed. The group may consist of one or more families or a number of persons in a similar age, social, or economic range. The interesting results from the nine case studies made in housing research indicate the possibilities in this field, particularly as this method might be used in psychological and sociological projects.

**Experimental.** The experimental method as employed in housing research, consisting of laboratory tests made under controlled conditions, has contributed valuable information available through no other sources. Home economists have pioneered in developing physical tests to determine space standards for the house, in using motion-time techniques and in applying physiological tests in certain phases of housing research. The fact that architects and builders, as well as research groups in other areas than home economics, are beginning to turn to home economists for verified information on certain phases of housing is an indication of the contribution this group is making in experimental research.

*Physical tests* constitute the largest group of experimental studies, 60 in all, representing 77 percent of the experimental studies and 24 percent of all studies. They include the studies on space needs and use, design, construction, decoration, house care, lighting, decoration, and, as indicated in Part II, performance of equipment.

*Motion-time studies* account for 20 percent of the experimental studies in housing research and 6 percent of all the studies. Records of trips have progressed from the pin-string method used in early

studies to the trip charts and dye patterns used recently. Observations are recorded not only in writing but also on tape; and memomotion pictures are providing an excellent means of securing complete records for both motions and time.

Only two experimental studies were based on *physiological reactions* to various situations. This small number is not in proportion to the importance of these studies nor their potentialities.

Cornell University has in recent years entered this field of research with two significant studies. In one, metabolic rate, heart rate, respiration, and blood pressure were used to measure some of the effects of height of ironing surface on the worker.<sup>1</sup> The equipment and techniques developed are worthy of careful study by all interested in the development of this kind of research. The second study measured, by determining the amount of oxygen consumed, the energy expended in certain household tasks involving bending, lifting, reaching, stooping, pushing, pulling, and twisting.<sup>2</sup>

A new technique for experimental research, taken from the field of psychology, is being investigated for its possibilities in housing research at the University of Georgia. This is the tremor test, an attempt to measure the emotional responses of the worker to her working environment. The instrument used is a tromometer which measures the three-dimensional movements of the finger of the worker and indicates quantitatively the effect of certain conditions upon involuntary movements.<sup>3</sup> A comparatively simple test, it will be a welcome addition to housing research if it proves reliable in testing the worker's reactions to household tasks, particularly those not requiring enough energy to warrant the use of a metabolism tester.

**Some observations regarding experimental research.** Physical tests to determine space needs for the many and varied activities carried on in the house, and for the numerous kinds of household equipment, supplies, and furnishings used in the house have been carried on more continuously and more thoroughly than any of the other kinds of laboratory research. This has been so because the need for such information has been urgent and the methods for making these tests comparatively simple. Even since the regional housing surveys made in 1947 and 1948 there has been a marked acceleration

<sup>1</sup> Some effects of the height of ironing surface on the worker. Elaine Knowles. N.Y. (Cornell) Sta. Bul. 833. 1946.

<sup>2</sup> Oxygen consumed in household tasks. Esther Crew Bratton. N.Y. (Cornell) Sta. Bul. 873. 1951.

<sup>3</sup> The finger tromometer. A. S. Edwards. Amer. Jour. Psych. 59, 273-283. Apr. 1946.



in this kind of research, characterized by improved techniques and by planned programs of work in each region. Because of changing concepts of housing, new designs for equipment and furniture, and incomplete data on activity measurements of people, there will be a continuing need for space studies in housing.

Work-simplification research, originating in industry, has set up valuable principles that can be applied by homemakers for saving motions and time. However, it must be recognized that such research is conducted under minutely controlled conditions which are not normally duplicated by the homemaker. No two women work exactly alike, or under identical situations, or with identical equipment. Neither does a woman necessarily do a task in exactly the same way when she repeats it. Unavoidable interruptions and different combinations of tasks often make this impossible. Thus the emphasis for the homemaker must be on principles of work simplification developed by motion-time studies rather than on set arrangement or set procedures, resulting from work-simplification research.

Physiological tests give promise of providing a more precise method for certain kinds of housing research than some of the other methods used. This is because the physiological mechanism of the human body, in spite of individual differences in reactions to conditions and activities, is stable and unchanging as compared with the number and kind of household possessions, the methods of housekeeping and food preparation, the types of houses, the building practices, and the patterns of family living which have furnished the raw materials for much of the physical and work-simplification research conducted in home economics to date.

Nevertheless, there are certain problems that must be faced and solved before physiological research can be generally used in the housing field. One is the lack of home economists trained in this highly specialized area. Lack of training need not be a handicap, however, if the home economist recognizes her limitations and seeks the cooperation of the physiologist, the physicist, and other needed specialists, as was done in the Knowles study at Cornell.

Another problem is that suitable equipment must be designed, constructed, and tested. At present, for example, no really satisfactory metabolism tester is available for prolonged household activity tests. In the Knowles study, which involved other physiological reactions in addition to metabolic rate, it was necessary to design and build costly equipment since none of the kind needed was available on the market.

A third problem in physiological research more difficult to solve than training the researcher or obtaining equipment arises from the variability in individuals' physiological responses caused by the



psychological or emotional factor. People cannot be standardized or calibrated like machines. They react emotionally as well as physically and it is a question whether the types of reaction can be separated. The psychological element causes the most variation in physiological responses and is more difficult to control than the physical. This fact was evident in the Knowles study, in the activity-measurement studies made by McCullough, and in the tremor tests checked by Hood. An encouraging fact, as stated by Bratton, is that the pattern of relationships in oxygen consumption in the activities tested in her study was similar for all the individuals even though the variation among them was high.

Presumably the time will come when the psychological and sociological reaction of people to housing will be given as serious consideration in research as the physical aspects are now being given. A beginning along this line has been made, for example, at the University of Illinois in the Small Homes Council space-laboratory projects. In this experiment, families live in a house with flexible walls for a given number of months, during which time several different floor plans are tested through actual use. The reactions of individuals and families to the various arrangements afford excellent data for psychological and sociological study.

### **Extent of Cooperative Research**

Approximately one-fourth of the 255 studies have been conducted by two or more institutions cooperating. Of these 65 studies, 57, or 22 percent of the total, were regional cooperative projects; 7 were made by state experiment stations and the Bureau of Human Nutrition and Home Economics; and one was made by two experiment stations (Oregon and Washington State Colleges).

The regional projects were organized under the direction of technical committees in each of four principal regions of the United States: the Northeast, the North Central, the South, and the West. The original regional projects consisted of surveys of rural housing conditions and of family needs and preferences with regard to housing in each region, and were actively participated in by thirty-one states. After the surveys were made, the project in each region was divided into subprojects which were either assigned to individual stations or were continued by the regional group in cooperation with the Bureau.

### **Graduate Research**

Each institution was asked to scrutinize its student studies with particular care and include only those which might be rated as research. Obviously many graduate studies are "academic exercises"

intended to give experience in methods of conducting and reporting research rather than to make any vital contribution to subject matter. How well the schools screened their entries is a question since there is a lack of objective standards for judging research in housing. Some schools submitted all their graduate studies, including those which were problems instead of theses; others weeded the studies carefully, submitting only those which, according to their judgment, met the standards of research.

Worth-while research, however, has been done by graduate students. Seventeen of the studies were made in experiment stations, and of the total 131 studies, 23 were published. No doubt there is valuable material in other student studies that has not received the publicity it deserves.

Five of the six studies for the Ph.D. degree were done at Cornell University, one at the University of Minnesota.

Oregon ranked highest in number of master's theses, with 22. Purdue University and Iowa State College were second with 10 each. Washington State College and Cornell had 9 each, Ohio State University 8; Kansas and Texas State College for Women, 5 each. The universities of Chicago, Syracuse, and Wisconsin, the Woman's College of the University of North Carolina, and Oklahoma A. and M. had 4 each; Tennessee, 3. Other institutions contributed either one or two studies each.

Of the 23 graduate studies published, 8 were by Cornell, 4 by Washington State College, 3 by Oregon State College, 2 each by Wisconsin and Ohio State University, and one each by Chicago, Purdue, Kansas State College, and Syracuse. The 23 studies appeared in 26 publications: 9 experiment station bulletins, 5 extension bulletins, and 12 professional or technical magazines.

### Sources of Funds

Nearly half the projects listed in this report have been supported entirely or in part by agricultural experiment station funds, and about one-tenth have received state, Bureau of Human Nutrition and Home Economics, or industrial support. For more than two-fifths of the studies, most of them made by students, no specific appropriations were listed.

The sources of funds may be summarized as follows:

Agricultural experiment stations.....	47 percent
Bureau of Human Nutrition and Home Economics...	6 percent
State funds.....	4 percent
Commercial and other grants.....	1 percent
No special funds required.....	42 percent

## Number of Publications

A total of 115 printed publications and articles report the research done in 106 of the housing studies.<sup>1</sup> Reports on five others have appeared in mimeographed form but are not included in the summaries because they are not available in libraries. Thus 42 percent of the 255 studies have been published in some form, several of the studies in more than one place. The regional cooperative studies of housing needs and preferences, while representing extensive research by many institutions and individuals, are combined into five publications.

About four-fifths of the publications are in the form of bulletins, circulars, and professional and technical journals, as shown below:

Experiment station bulletins and circulars.....	51
Professional and technical journals.....	29
Extension bulletins and circulars.....	6
Other bulletins and circulars.....	2
Popular magazines .....	3
Handbooks .....	3
Miscellaneous publications .....	3
USDA publications.....	18
Total.....	115

The details of distribution, number, and kinds of publications are given in Table 5.

## Place of Home Economics in Housing Research

Increased activity in home-economics housing research in recent years parallels the greater national interest in housing. The Housing and Home Finance Agency is engaged in an extensive research program, and the Building Research Advisory Board of the National Research Council is stimulating effort by correlating findings in this field. Industrial groups, public institutions and agencies, and nonprofit foundations have given a great deal of attention to housing improvement. A few universities have made notable contributions to house heating, construction methods, and space planning. Agricultural engineers have taken an active part in farmhouse research, determining needs, defining rural housing problems, preparing plans, and providing a sound basis for their recommendations.

If, as has been said, the period of greatest advancement in any science or industry coincides with the period of its greatest activity in research, then it would seem that housing in the United States is on

<sup>1</sup> It should be noted that Cornell, unlike other institutions, listed only those publications having a professional rating such as experiment station bulletins and a few articles in professional journals. Otherwise the number of publications would have been higher.

Table 5. — Publication of Housing Studies

Institution <sup>a</sup>	Total studies, including regional cooperative	Studies published	Number and types of publications <sup>b</sup>	Total publications
Alabama.....	2	1*	.....	..
Arizona.....	4	2*	1 Station.....	1
Arkansas.....	2	1*	.....	..
California.....	4	2*	1 professional article, 1 popular.....	2
Colorado A. and M.....	3	1*	.....	..
U. Colorado.....	1	..	.....	..
Connecticut.....	1	1*	.....	..
Delaware.....	1	..	.....	..
Georgia.....	3	1*	2 Station (including 1 regional cooperative).....	2
Chicago.....	4	1	1 professional article.....	1
Illinois.....	10	9*	4 Station, 2 S.H.C. circulars, 1 S.H.C. handbook, 8 professional articles.....	15
Purdue (Ind.).....	11	2*	1 professional article.....	1
Iowa.....	11	1*	1 Station (regional cooperative).....	1
Kansas.....	10	3*	2 professional articles.....	2
Kentucky.....	1	..	.....	..
Louisiana.....	1	..	.....	..
Maine.....	3	1*	.....	..
Michigan.....	1	1	1 Station.....	1 *
Minnesota.....	2	1*	.....	..
Mississippi.....	1	2*	1 Station, 1 professional article.....	2
Missouri.....	2	1*	.....	..
Montana.....	4	1*	.....	..
Nebraska.....	8	5**	3 Station.....	3
Rutgers (N.J.).....	1	1*	.....	..
Cornell (N.Y.).....	23	12*	8 Station (including 1 regional cooperative), 6 Extension, 1 handbook, 1 professional article.....	16
Syracuse (N.Y.).....	5	1	1 professional article.....	1
N. Carolina.....	6	..	.....	..
Ohio State U.....	10	3*	2 professional articles.....	2
Ohio U.....	1	..	.....	..
Oklahoma.....	4	..	.....	..
Oregon.....	32	10*	10 Station, 2 USDA, 5 professional articles, 1 handbook.....	18
Pennsylvania.....	5	3*	3 Station.....	3
Rhode Island.....	8	8*	4 Station, 3 miscellaneous.....	7
Clemson (S.C.).....	3	1*	.....	..
Tennessee.....	5	1*	.....	..
N. Texas State Teach.....	2	..	.....	..
Prairie View (Tex.).....	1	..	.....	..
Texas St. for Women.....	5	..	.....	..
Texas Tech.....	1	..	.....	..
U. Texas.....	1	..	.....	..
Utah.....	3	1*	.....	..
Vermont.....	6	4	4 Station.....	4
Virginia Poly.....	1	1*	.....	..
Virginia St.....	2	..	.....	..
Washington.....	14	9*	7 Station.....	7
West Virginia.....	2	2*	1 Station.....	1
Stout (Wis.).....	2	..	.....	..
Wisconsin.....	7	3*	1 Station, 2 professional articles.....	3
BHNHE.....	15	9	16 USDA, 4 professional articles, 2 popular articles.....	22
Total.....	255	106	.....	115
Percent of studies published.....	...	42	.....	...

<sup>a</sup> For more complete names of institutions, see Table 4.

<sup>b</sup> The three regional housing studies published by Georgia, Iowa, and Cornell are included only under those states. Trade magazines and house organs are classified here as professional magazines.

\* Including a regional cooperative study published jointly with other institutions.

\*\* One study was regional, the other cooperative with California, Rhode Island, and BHNHE.

the threshold of definite progress toward meeting the complex and diversified needs of family living.

In its broadest aspects, housing research requires the participation of trained personnel from architecture, engineering, economics, political science, geography, physiology, sociology, anthropology, and home economics. As members of this larger group, home economists can make their chief contribution in the family-living aspect of housing research. As this report reveals, their studies have been largely concerned with accumulating data on family needs and preferences in housing; determining requirements and establishing space standards for various areas of the house; and relating good management practices to house planning.

Home economists can further the good work started in housing research by intensifying their work in those areas in which they are qualified to make their best contribution, by developing sound research methodology, by attaining well-rounded and complete studies through interdisciplinary cooperation, and by publishing the results of their research in a form that will be available to all those who are interested in promoting better housing.

## **PART II: HOUSEHOLD EQUIPMENT RESEARCH**

Information on household-equipment research was collected with that on housing. The same questionnaire was used and the same limitations and problems were encountered. The equipment studies covered the same period and were conducted by similar methods of research. Fewer in number (138 studies compared with 255 in housing), they were made in fewer institutions and, as could be expected, represented a narrower range of subject matter. For these reasons the report of household-equipment studies has been condensed to a greater degree than that of the housing studies.

The first equipment study was listed in 1925 under housing at Nebraska. A year later five studies were reported under household equipment. Two were made at the University of Chicago, two at Iowa State College, and one at the University of Nebraska. The number of studies per year up through 1950 was much more uniform than for housing, as is evident from the graph shown below. The largest number of studies started in any one year, 10 in 1947, was only two more than the high for previous years (see Fig. 2).

The number of studies started each year by various institutions for the period 1925 through 1950 is shown in Table 6.

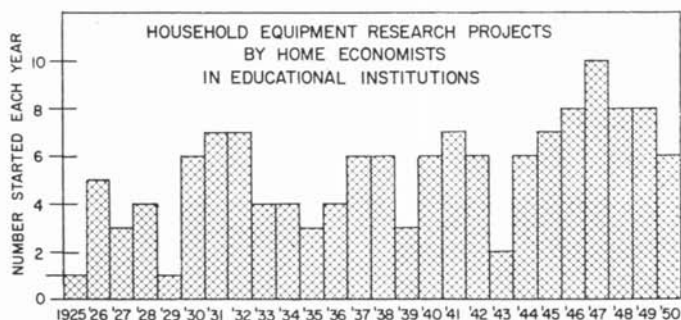
Because of the development of new kinds of household equipment and the frequent changes in existing models, much equipment research is of temporary value, and the field will require continuing study.

Table 6. — Number of Equipment Projects Started Annually, 1925-1950

Year	Total proj- ects	Institution <sup>a</sup> and number of projects at each	Year	Total proj- ects	Institution <sup>a</sup> and number of projects at each
1925	1	Nebraska 1	1941	7	Iowa 6; BHNHE 1
1926	5	Nebraska 1; Iowa, Chicago, 2 each	1942	6	Ohio St. U., BHNHE, 1 each; Iowa, Oregon, 2 each
1927	3	BHNHE 1; Iowa 2	1943	2	Ohio St. U., U. Washington, 1 each
1928	4	Iowa, Nebraska, 1 each; Chicago 2	1944	6	Iowa, Nebraska, Cornell, BHNHE, 1 each; Penn- sylvania 2
1929	1	Iowa 1	1945	7	California, Cornell, Syracuse, 1 each; BHNHE 4
1930	6	Chicago, Nebraska, 1 each; Iowa 4	1946	8	Georgia, Kansas, Maine, Minnesota, Ohio St. U., Nebraska, Rhode Island, BHNHE, 1 each
1931	7	Nebraska, Maine, 1 each; Iowa 5	1947	10	Purdue, Kansas, Maine, Columbia, 1 each; Iowa, Nebraska, BHNHE, 2 each
1932	7	Georgia 1; Kansas 2; Iowa 4	1948	8	Montana, Ohio St. U., BHNHE, 1 each; Purdue 2; Iowa 3
1933	4	Maine, Nebraska, Ohio St. U., Rhode Island, 1 each	1949	8	Syracuse 1; Iowa, BHNHE, 2 each; Ohio St. U. 3
1934	4	Kansas 1; Iowa 3	1950	6	Nebraska, Syracuse, Oregon, Vermont, 1 each; Ohio St. U. 2
1935	3	Maine, Nebraska, Cornell, 1 each	Total	138	
1936	4	BHNHE, Washington St., 1 each; Iowa 2			
1937	6	Ohio St. U. 1; Nebraska 2; Iowa 3			
1938	6	Maine, Rhode Island, 1 each; Iowa 4			
1939	3	BHNHE 1; Iowa 2			
1940	6	Purdue, Maine, Nebraska, BHNHE, 1 each; Iowa 2			

<sup>a</sup> For more complete names of institutions, see Table 4, page 13. Here, for brevity, only the state is given when only one institution from that state is listed in Table 4.

Unlike housing research, in which few of the areas studied by home economists in the colleges have been duplicated by other agencies, household equipment research is done constantly by the companies manufacturing such equipment and by other technical organizations under much more scientific conditions than exist in most departments of home economics.



Equipment research was carried on much more uniformly than housing research through the years 1925 to 1950 (see page 6). (Fig. 2)

However, just as the family living aspect of housing has provided a relatively unexplored field of research for the home economist, so are there aspects of equipment research not duplicated by other groups. These fields include research on equipment as it is used in the home, its best use for specified activities, such as the use of automatic machines for the washing of wool blankets studied at Ohio State University, and comparison of specified characteristics of different models of the same type of equipment. Furthermore, graduate studies in equipment, regardless of their general or permanent value, have afforded and will continue to afford a valuable means of training for the student.

### Types of Institutions Where Work Was Done

The types of institutions in which the household equipment research was done were the same as those for housing—land-grant colleges and universities, a few colleges and universities other than land-grant, and the U.S. Bureau of Human Nutrition and Home Economics.

Only 21 institutions, however, were represented in equipment research (Table 7) compared with 49 in housing research. Sixteen were land-grant, four were other than land-grant, and one was the Bureau of Human Nutrition and Home Economics.

Of the total 138 studies, 111, or 80 percent, were made in land-grant institutions, 10 in other colleges and institutions, and 17 in the Bureau of Human Nutrition and Home Economics.

### Aspects and Kinds of Equipment Studied

Eighty-seven studies in household equipment, or 63 percent of the total number, were tests of performance. Studies in the development of specifications, 22 in number, rank second; and those of equipment from the angle of space requirements, 13 in number, are third. The rest consist of educational material, management (including care and maintenance), cost, and the historical development of specified kinds of equipment. For further details see Table 7.

Table 7.—Aspects of Equipment Studied

Institution <sup>a</sup>	Per- form- ance	House plan- ning	Manage- ment	Other	Total studies <sup>*</sup>
California.....	..	1	..	.....	1
Georgia.....	2	..	..	.....	2
Chicago <sup>b</sup> .....	3	..	1	Historical 1	5
Purdue (Ind.).....	4	..	..	.....	4
Iowa.....	32	1	3	Specifications 13, education 1, economics 1	51
Kansas.....	3	..	1	Economics 1	5
Maine.....	7	..	..	.....	7
Minnesota.....	1	..	..	.....	1
Montana.....	1	..	..	.....	1
Nebraska.....	12	2	1	.....	15
Columbia (N.Y.) <sup>b</sup> .....	..	..	1	.....	1
Cornell (N.Y.).....	1	1	..	Specifications 1	3
Syracuse (N.Y.) <sup>b</sup> .....	..	..	..	Education 3	3
Ohio St. U.....	7	3	..	Education 1	11
Oregon.....	..	3	..	.....	3
Pennsylvania.....	2	..	..	.....	2
Rhode Island.....	1	1	1	.....	3
Vermont.....	..	..	..	Specifications 1	1
Washington St.....	1	..	..	.....	1
U. Washington <sup>b</sup> .....	1	..	..	.....	1
BHNHE—Housing and Household Equipment Division.....	9	1	..	Specifications 7	17
Total.....	87	13	8	30	138
Percent.....	63	9	6	22	100

<sup>a</sup> For more complete names of institutions, see Table 4.

<sup>b</sup> Not land-grant.



Table 8. — Number of Studies of Different Kinds of Equipment

Institution*	Ranges and cookers	Refrigerators and freezers	Small kitchen equipment	Laundry equipment	Equipment in general	Other equipment	Total studies
California.....	..	..	1	..	..	..	1
Georgia.....	1	..	..	..	..	Food beaters 1	2
Chicago.....	1	..	..	..	..	Dishwashers 3, vacuum cleaners 1	5
Purdue (Ind.)....	..	..	..	3	..	Food mixers 1	4
Iowa.....	16	10	9	4	3	Food mixers 3, dishwashers 2, lighting 2, cleaning 1, canning 1	51
Kansas.....	4	..	..	1	..	..	5
Maine.....	5	..	1	..	..	Sinks 1	7
Minnesota.....	..	1	..	..	..	..	1
Montana.....	..	..	..	..	..	Pressure cooker 1	1
Nebraska.....	6	..	1	1	..	Pressure cookers 2, lighting 2, pasteurizers 1, food mixer 1, vacuum cleaners 1	15
Columbia (N.Y.)..	..	..	..	..	..	Vacuum cleaners 1	1
Cornell (N.Y.)..	..	1	1	..	..	Sinks 1	3
Syracuse (N.Y.)..	..	..	..	..	3	..	3
Ohio St. U.....	..	3	1	3	1	Lighting 2, dishwasher 1	11
Oregon.....	..	..	2	..	1	..	3
Pennsylvania.....	..	2	..	..	..	..	2
Rhode Island.....	..	1	2	..	..	..	3
Vermont.....	..	..	..	1	..	..	1
Washington St....	..	..	..	..	..	Water heater 1	1
U. Washington....	..	..	..	..	1	..	1
BHNHE — Housing and Household Equipment Division.....	4	7	1	2	..	Canning equipment 1, electricity 1, dehydrator 1	17
Total.....	37	25	19	15	9	33	138
Percent.....	27	18	13.5	11	6.5	24	100

\* For more complete names of institutions, see Table 4.

Practically every kind of equipment used in the household has been covered in the research (Table 8). Ranges, refrigerators and freezers, small kitchen equipment, and laundry equipment, in order of rank, account for 96 studies, or 70 percent. Food mixers, lighting equipment, canning equipment, and water heaters range from 5 down to one studies, while 9 studies cover equipment in general.

### Types of Equipment Research

Of the 138 household equipment studies, 120, or 87 percent, were made in whole or in part by experimental methods. The majority of these experimental studies were performance tests with physics forming the background science. In one at the University of Chicago physiological techniques were used, and one at Kansas State College was a motion-time study.

\* The number of experimental studies made at the various institutions was as follows:

Iowa .....	49
BHNHE.....	15
Nebraska .....	14
Ohio State .....	7
Maine.....	6
Kansas .....	5
Chicago, Purdue (4 each).....	8
Georgia, Cornell, Pennsylvania, Rhode Island (2 each).....	8
California, Minnesota, Montana, Columbia, Oregon, Vermont, Washington State, University of Washington (1 each)....	8

Surveys accounted for 15 studies: three each at Syracuse and Ohio State University; two each at Iowa and Oregon State Colleges and at BHNHE; one each at Nebraska, Cornell, and Rhode Island.

Three studies, one each at the Universities of Chicago and Maine and one at Ohio State University, used library methods.

### Extent of Cooperative Research

Relatively few equipment studies were conducted cooperatively by institutions. Twelve studies were listed by states as having been made with the Bureau of Human Nutrition and Home Economics; however, the Bureau indicated only six such studies made with states. The Bureau listed two studies as made with other government agencies. One equipment study was conducted jointly by three states: Purdue, Iowa, and Nebraska.

### Graduate Studies

Graduate studies, 81 in number, make up 59 percent of all the household equipment studies by home economists. Seventy-eight of these were master's theses, and three were graduate problems.

Only 11 institutions have done graduate research in equipment. For more than half the studies, Iowa State College is alone responsible. The majority of these were done under the direction of Dr. Louise Peet. The studies were distributed among the 11 institutions as follows:

Chicago.....	5	Syracuse.....	3
Georgia.....	2	Ohio State.....	8
Purdue.....	2	Oregon.....	3
Iowa.....	49	Pennsylvania.....	2
Kansas.....	5 <sup>a</sup>	Washington.....	1 <sup>b</sup>
Cornell.....	1	Total.....	81

<sup>a</sup> Two were graduate problems.

<sup>b</sup> Graduate problem.

Only three of the graduate studies were made in agricultural experiment stations—one at Cornell and two at Ohio State University.

Twelve of the studies have been published in 18 publications including one book, 5 experiment station bulletins, one extension bul-

letin, 11 professional magazines. Fourteen of these were from Iowa State College. Chicago, Cornell, Syracuse, and Ohio State University have each published one study.

### Number of Publications

Fifty-eight of the household-equipment studies, or 42 percent, have been published in a total of 82 books, bulletins, circulars, leaflets, and professional and popular magazines. This percentage is the same as that for the housing studies.

Among the institutions having more than three publications, the Bureau of Human Nutrition and Home Economics ranks first with 27 publications based on 10 projects. Iowa State with 16 publications resulting from 15 projects is second. The University of Nebraska is

Table 9. — Equipment Studies Published

Institution <sup>a</sup>	Total studies	Number of studies published	Type of publication	Total publications
California.....	1	1	1 professional article, 1 popular article	2
Georgia.....	2	..	.....	..
Chicago.....	5	1	1 professional article	1
Purdue (Ind.)....	4	1 <sup>b</sup>	(1 cooperative)	(1) <sup>b</sup>
Iowa.....	51	15	5 Station, 9 professional articles, 1 popular article, 1 handbook	16
Kansas.....	5	..	.....	..
Maine.....	7	7	7 Station, 3 Extension, 2 professional articles	12
Minnesota.....	1	1	1 professional article	1
Montana.....	1	..	.....	..
Nebraska.....	15	11 <sup>b</sup>	10 Station, 3 Extension	13
Columbia (N.Y.)..	1	..	.....	..
Cornell (N.Y.)....	3	2	1 Station, 1 professional article	2
Syracuse (N.Y.)...	3	1	1 professional article	1
Ohio St. U.....	11	3	2 Station	2 <sup>c</sup>
Oregon.....	3	..	.....	..
Pennsylvania.....	2	..	.....	..
Rhode Island....	3	3	3 Station	3
Vermont.....	1	1	1 Station	1
Washington St....	1	1	1 professional article	1
U. Washington....	1	..	.....	..
BHNHE.....	17	10	7 USDA publications, 18 professional articles, 2 popular articles	27
Total.....	138	58	.....	82
Percent of studies published.....	..	42	.....	..

<sup>a</sup> For more complete names of institutions, see Table 4.

<sup>b</sup> Including one cooperative study published by Iowa.

<sup>c</sup> In one instance two projects were published in one bulletin.

next with 13 publications based on 11 studies. The University of Maine ranks fourth with 12 publications for 7 studies. Maine is the only institution in this group that has published the results of all its projects. For further details see Table 9.

### Sources of Funds

Less than half of the household-equipment studies were financed by specified funds. Thirty-two percent were supported by agricultural experiment stations; 12 percent by the Bureau of Human Nutrition and Home Economics; and 4 percent by special grants. Seventy-two projects, or 52 percent, all of which were studies by graduate students, had no formally indicated financial support.

The breakdown of the sources of funds for research is as follows:

	<i>Studies</i>
Agricultural experiment stations, including projects cooperative with the U. S. Department of Agriculture.....	44
BHNHE.....	17
Special grants .....	5
No formal financial support (graduate studies).....	72

## PART III: PROJECTS AND PUBLICATIONS

The housing and household-equipment projects and publications listed on the following pages are those submitted by the various institutions for this report.

All institutions are listed alphabetically by the names of the states in which they appear. Although the projects extend only through 1950, some of the publications are dated later.

The first names of project leaders and authors are given only once. When authors' names are not given with the publications, it is because they are the same as those listed with the project. Mimeographs were omitted because they are unavailable in libraries.

Where graduate studies are cited, the name of the major instructor, if given, is listed after *with*. Not all of the graduate studies can be obtained through library loan.

### Housing

#### Alabama Polytechnic Institute

- 1947- Functional requirements and plans for Southern rural homes. Florence
- 1949 Davis. Agr. Exp. Sta. Regional cooperative. *Publication* (see Georgia)
- 1950- Development of modular movable storage walls for storage units.  
Davis and Gladys Garrow. Agr. Exp. Sta. Regional cooperative.

### Housing

#### University of Arizona

- 1947 Improvement of rural housing in the Western region: A study to determine functional requirements. B. Eleanor Johnson. Agr. Exp. Sta. Regional cooperative. *Publication* (see BHNHE)

- 1948 Cost of a health and decency standard of living in Tucson, Arizona in 1943-1944. Alice Books with Johnson. *Master's thesis*.
- 1949 Indoor play areas for the preschool child. Johnson. Agr. Exp. Sta. Regional cooperative. *Publication*:  
(Same title as project) Ariz. Tech. Bul. 126, 1952.
- 1950 Dining area storage of linen, dishes, silver, glassware, and table appliances used in indoor meal service in rural homes in the Western Region. Johnson. Agr. Exp. Sta. Regional cooperative.

### University of Arkansas

#### Housing

- 1949 Functional requirements and plans for Southern rural homes. Beulah V. Gillaspie. Agr. Exp. Sta. Regional cooperative. *Publication* (see Georgia)
- 1950 Space and storage requirements for a combination living-sleeping area. Gillaspie. Agr. Exp. Sta. Regional cooperative.

### University of California<sup>1</sup>

#### Housing

- 1945- \*A study of the use of kitchen utensils, menus, and home food practices in farm communities. Jean Warren, Marlyn McKay. Agr. Exp. Sta. with BHNHE and Nebraska and Rhode Island Stations. *Publications*:  
Cooking utensils based on meal patterns. Jour. Home Econ. 40(6). 1948.  
Utensils every farm kitchen should have. Avis Woolrich. Farm Jour. 72(6). 1948.
- 1947 Improvement of rural housing in the Western region: A study of functional requirements. Warren, McKay. Agr. Exp. Sta. Regional cooperative. *Publication* (see BHNHE)
- 1950 Cleaning closets. Warren, McKay. Agr. Exp. Sta. Regional cooperative.
- 1950 Room relationships. Warren, McKay. Agr. Exp. Sta. Regional cooperative.

### Colorado A & M

#### Housing

- 1947 Environmental factors affecting housing. May E. Combs. Agr. Exp. Sta. Regional cooperative.
- 1948 Improvement of rural housing in the Western region: A study to determine functional requirements. Combs. Agr. Exp. Sta. Regional cooperative. *Publication* (see BHNHE)
- 1950 Dressing areas. Combs. Agr. Exp. Sta. Regional cooperative.

### University of Colorado

#### Housing

- 1947 Housing needs and preferences of fifty farm families of Kane county, Illinois. Helen M. Brauns with Ruth Blair. *Master's thesis*.

### University of Connecticut

#### Housing

- 1947- Farm housing requirements in the Northeast region. M. S. Klinck.
- 1949 Agr. Exp. Sta. Regional cooperative. *Publication* (see Cornell)

\* Also included under equipment in statistical summaries.

<sup>1</sup> At Davis.

**Housing****University of Delaware**

- 1950 Comparison of efficiency of three typical kitchen arrangements in the School of Home Economics. Florence C. Clements. *Master's thesis*.

**Housing****University of Georgia**

- 1947- Functional requirements and plans for Southern rural homes. Maude  
 1949 Pye Hood. Agr. Exp. Sta. Regional cooperative. *Publications:*  
     Farm housing in the South. South. Coop. Ser. Bul. 14. 1951.  
     Family housing needs and preferences of Georgia farm families.  
     Hood and Marion Walker. Ga. Sta. Bul. 2. 1952.
- 1948- Housing conditions related to hospitality activities of owner-operator  
 1949 farm families in Georgia. Ethel Davis with Hood. *Master's thesis*.
- 1950 Requirements for work and recreation areas for Southern rural homes:  
 Analysis of space in Southern farm kitchens for preparation of baked  
 products. Hood and Rachel Rutherford. Agr. Exp. Sta. Regional  
 cooperative.

**Equipment**

- 1932 Effect of oven linings of different materials on thermal deficiency of  
 pans of different material finishes. Geraldine Ellis with Bennie G.  
 Danner. *Master's thesis*.
- 1946 Preparation of whole-egg meringues of good baking quality for sponge  
 cake with three types of beaters. Montez D. Hinkle with Hood.  
*Master's thesis*.

**Housing****University of Chicago (Illinois)**

- 1926 Recent housing developments in the United States from the point of  
 view of the woman in the home. Wilkie L. Hines. *Master's thesis*.
- 1929 A time and motion comparison of four methods of dishwashing.  
 Nellie Maud Vedder with Mary K. Heiner. *Master's thesis. Publication:*  
     Studies in dishwashing methods: An attempt to apply methods of  
     job analysis to a household process. Jour. Home Econ. 22(5). 1930.
- 1944 Some financial aspects of the subsidized housing program in the  
 United States. Helen J. Hunt. *Master's thesis*.
- 1947 Cooperative housing in the United States. Jean Karin with Hazel  
 Kyrk. *Master's thesis*.

**Equipment**

- 1926 Comparative time, efficiency, and cost studies for gas and electric  
 ranges. Gladys Titsworth Percy. *Master's thesis*.
- 1926 Power dishwashing machines. Lilly E. Kohl. *Master's thesis*.
- 1928 Human-energy cost of operating a vacuum cleaner at different speeds.  
 Venona W. Swartz. *Master's thesis. Publication:*  
     (Same title as project) Jour. Home Econ. 21(6). 1929.
- 1928 Study of the new model electric and sink spray dishwashers. May  
 Gleeson. *Master's thesis*.

- 1930 A dishwashing machine: A study of the history of its development for institution use. Ethel Clark. *Master's thesis*.

## Housing

## University of Illinois

- 1930- Consumption studies of rural families. Ruth C. Freeman. Agr. Exp. Sta. *Publications*:  
     What farm families spend for housing. Ill. Sta. Bul. 526. 1948.  
     What farm families spend for housing. Jour. Home Econ. 43(4). 1951.
- 1944 Pattern of consumption of fifty farm homemakers. Cleo Fitzsimmons, Nellie L. Perkins. Agr. Exp. Sta. *Publications*:  
     Homemaking plans of fifty farm homemakers. Rural Sociol. 10 (4). 1945.  
     Fifty farm kitchens. Jour. Home Econ. 37(9). 1945.  
     Some Illinois housing consumption patterns. Jour. Home Econ. 39 (10). 1947.
- 1945 Survey of some fatigue problems of rural homemakers, with special emphasis on home laundering facilities and practices. Perkins, Wilma Beyer, Lita Bane. Agr. Exp. Sta. *Publication*:  
     (Same title as project) Ill. Sta. Bul. 514. 1945.
- 1947- Kitchen planning. W. H. Scheick, Helen E. McCullough, Elizabeth M.  
 1949 Ranney, K. O. Small, C. V. Richardson. Small Homes Council and Agr. Exp. Sta. Commercial grant. *Publications*:  
     Cabinet space for the kitchen. McCullough. SHC Cir. C5.31. 1949.  
     Kitchen planning standards. Ranney. SHC Cir. C5.32. 1949.  
     Handbook of kitchen design. SHC Cir. C5.32R. 1950.  
     The home economist's contribution to the architect in kitchen planning. McCullough. Kitchen Rptr. Apr. 1951.
- 1947- Studies to determine farmhouse requirements. D. G. Carter, R. C.  
 1950 Cohlmeier, Marion Walker, Margaret A. Reed (Corbin). Agr. Exp. Sta. Regional cooperative. *Publication* (see Iowa)  
     Development of cooperative farm housing research. Carter, Corbin. Ill. Sta. Cir. 699. 1952.
- 1947- Farmhouse design, planning, and remodeling. Carter, McCullough, Cohlmeier, K. H. Hincheliff. Agr. Exp. Sta.
- 1947- Home economics housing and household equipment research: 1925-1950. McCullough. Agr. Exp. Sta. (Reported in this publication)
- 1949- Space requirements for the home laundry. McCullough. Agr. Exp.  
 1950 Sta. *Publication*:  
     A preliminary report on space requirements for the home laundry. Jour. Home Econ. 44(6). 1952.
- 1950- Determination of space standards for household storage on a modular basis. McCullough. Agr. Exp. Sta. *Publication*:  
     Space design for household storage. Ill. Sta. Bul. 557. 1952.
- 1950- Standards for unit kitchens in secondary schools. Mildred Moore, McCullough, L. C. Piggage. Special grant. *Publications*:  
     Equipment that equips for teaching management. Moore. Pract. Home Econ. 30(4). 1952.  
     Functional storage in the unit kitchen. Moore. Pract. Home Econ. 30(5). 1952.

**Housing****Purdue University (Indiana)**

- 1943 Study of the 4-H room-improvement projects in 19 counties in Indiana, with suggestions for changing the project. Mary L. Bone with Mary L. Matthews. *Master's thesis.*
- 1943 Study of 100 rehoused families in Muncie, Indiana. Laura I. Beltz with Matthews. *Master's thesis.*
- 1944 Changes in leisure time and community activities of 100 white families after rehousing in Columbia Gardens, Hammond, Indiana. Geraldine Miller with Matthews. *Master's thesis.*
- 1946 Floor plans for remodeling six farmhouses in Seneca and Warren counties, Ohio. Doris Snook with Matthews. *Master's thesis.*
- 1947 Examination of possible criteria for minimum adequacy in kitchen-storage provision for families of four. Rose V. White with Cleo Fitzsimmons. *Master's thesis.*
- 1947 Functional planning of bathrooms for farm homes. Florence Johnson with Matthews. *Master's thesis.*
- 1947- Study of room uses of 100 faculty members of Purdue University.  
1948 Ruth Birk with Matthews. *Master's thesis.*
- 1948 Farm-family living patterns, activities, and preferences to be used as a basis for functional planning of farm homes. Gail Redfield, Fitzsimmons. Agr. Exp. Sta. Regional cooperative. *Publication* (see Iowa)
- 1948 Evaluation of stock plans for farm homes. Catherine Sullivan with Matthews. *Master's thesis.*
- 1948 Gains and goals in housing and equipment of selected families in Indiana and Michigan. Mary B. Settle with Fitzsimmons. *Master's thesis.*
- 1948 Some storage requirements of a group of Indiana families. Helen L. Marley with Fitzsimmons. *Master's thesis. Publication:*  
Space needs for the family's clothing. Jour. Home Econ. 41(5). 1949.

**Equipment**

- 1940 Tests with nine electric food mixers. Redfield. Agr. Exp. Sta. *Publication* (see Iowa, 1940)
- 1947- Effectiveness of automatic vs. nonautomatic washing machines for  
1948 home laundering. Redfield. Agr. Exp. Sta.
- 1948 Performance of three automatic washing machines. Louise Nunneley with Fitzsimmons. *Master's thesis.*
- 1948 Performance of one semi-automatic and one automatic washing machine. Gertrude Monhaut with Fitzsimmons. *Master's thesis.*

**Housing****Iowa State College**

- 1931 \*Lighting of a home under various color conditions. Kathryn C. Waldron. *Master's thesis.*
- 1931 Equipping of houses most favorable for growth and development of the child. Mildred L. Lawton. *Master's thesis.*
- 1932 Determination of adequate and convenient household space for definite size homes. Ethel I. Mitchell with Louise J. Peet. *Master's thesis.*

\* Also included under equipment in statistical summaries.



- 1935 Certain factors in the standard of living of families living in a non-economic arable land area, with special reference to housing. Eleanor Haile with Peet. *Master's thesis*.
- 1935 Status of Iowa farm homes reported to need replacement. Helen Noyes with Peet. *Master's thesis*.
- 1936 Development of family housing as a field in home economics. Elsa Obst with Peet. *Master's thesis*.
- 1945 Functional aspects of the farm home in Iowa: Certain housing needs and preferences expressed by 55 farm families in Howard county. Lorna J. Gassett with Peet. *Master's thesis*.
- 1948 Functional facilities of a home-management house for teaching time-and-energy management. Lois Froelich with Florence Ehrenkranz. *Master's thesis*.
- 1948- Farm-family housing needs and preferences. Paulena Nickell, Marie Budolfson, Margaret Liston, Elizabeth C. Willis. Agr. Exp. Sta. Regional cooperative. *Publication*:  
Farm-family housing needs and preferences in the North Central region. Iowa Sta. Res. Bul. 378 (NC Reg. Pub. 20). 1951.
- 1950 Farm-family housing needs and preferences in the North Central region: I. Remodeling needed in owner-occupied farm houses. Eleanor R. Young with Ehrenkranz. Agr. Exp. Sta. *Master's thesis*.
- 1950 Farm-family housing needs and preferences in the North Central region: II. Relation to farm tenure. Sallie S. Koon with Ehrenkranz. Agr. Exp. Sta. *Master's thesis*.

## Equipment

- 1926 Some factors affecting the efficient operation of electric ranges. Miriam Rapp. *Master's thesis*.
- 1926 Method for determining specific amount of heat needed to cook lean meat. Paulina L. Holl. *Master's thesis*.
- 1927 Some mechanical problems in home dishwashing. Harriet C. Brigham. *Master's thesis*.
- 1927 Study of the operation cost of an electric oven. Zula M. Dowler. *Master's thesis*.
- 1928 Studies of equipment for electrical cooking. Lucille Harris. *Master's thesis*.
- 1929 Some factors involved in a mechanical method of washing cooking utensils. Natalie Morris. *Master's thesis*.
- 1930 Study of the effect of different materials and finishes on the thermal efficiency of pans. Bennie M. Gartrell. *Master's thesis*.
- 1930 Sensitivity of thermostatic controls on ovens. Clara L. Graves. *Master's thesis*.
- 1930 Some factors involved in water extraction in the home laundry process. Lila W. Pfautz. *Master's thesis*.
- 1930 Development of a process of cooking food with heat generated by resistance of the food to passage of an alternating electric current. Lenore E. Sater. *Master's thesis*.
- 1931 Time of washing as a factor in the cleaning efficiencies of electric washing machines of various types. Lela M. Vaughn. *Master's thesis*.

- 1931 Determination of the moisture content of gas and electric ovens under baking conditions, and effect of varied moisture content on a baked product. Bernice Strawn. *Master's thesis*.
- 1931 Comparative efficiency of electric and hand-operated utensils. Gabriele M. Kruger with Peet. *Master's thesis*.
- 1931 Comparative thermal efficiencies of casseroles of different materials when used in a gas and in an electric oven. May C. Frank. *Master's thesis*.
- 1932 Comparison of processing time for sterilization of certain nonacid vegetables canned by pressure-cooker, steam-bath, and oven methods. Alice McKaughan with Peet. *Master's thesis*.
- 1932 Determination of utilization of retained heat in electric range ovens. Grace B. Martin with Peet. *Master's thesis*.
- 1932 Thickness of sheet aluminum as a factor influencing the thermal efficiency of a utensil used in surface cookery on an electric range. Enid Sater with Peet. *Master's thesis*. *Publication*:  
Thickness of an aluminum utensil as a factor in its thermal efficiency when used in surface cookery on an electric range. Jour. Home Econ. 25(4). 1933.
- 1932 Energy consumption and air circulation in some mechanical refrigerators. Bertha Schuchart with Peet. *Master's thesis*.
- 1934 Electric cleaners. Elizabeth Beveridge with Peet. *Master's thesis*.
- 1934 Household refrigeration of the common cuts of beef, pork, and lamb. Dorothy Burnett with Peet. *Master's thesis*. Commercial grant. *Publication*:  
Care of meat in the household refrigerator. Peet. Iowa Sta. Res. Bul. 215. 1937.
- 1934 Relative performance of standard sheet and cast aluminum as materials for pans used in surface and oven cookery on gas and electric ranges. Katherine Steele with Peet. *Master's thesis*.
- 1936 Effect of light and black bottom aluminum pans on the efficiency of electric range units in long-process cookery. Betty Mackay with Peet. *Master's thesis*. *Publication*:  
Utilization of heat from electric surface units by certain cooking utensils. Peet and Lucille O. MacDonald. Iowa Sta. Res. Bul. 212. 1937.
- 1936 Operating efficiency of certain liquid-fuel ranges. Faith Madden with Peet. *Master's thesis*.
- 1937 Effect of family-size food mixers on methods of mixing plain cake. Ruth C. Farnham. *Master's thesis*.
- 1937 Comparison of four different electrical methods of cookery as measured by time and cost of cooking and desirability of products. Geneva I. Hewitt with Peet. *Master's thesis*.
- 1937 Storage efficiency of certain ice and electric refrigerators, as measured by bacteriological and chemical changes in foods. Florence Schaeffer with Peet. *Master's thesis*.
- 1938 Performance of certain ice and electric refrigerators under conditions comparable with home usage. Jeanette V. Lincoln with Peet. *Master's thesis*.

- 1938 Operating efficiency of household appliances: I. One- and two-unit electric-range ovens. Agnes C. Wilson with Peet. *Master's thesis*.
- 1938 Operating efficiency of household appliances: II. Effect of varying the number of watts per unit area in typical electric surface units. Evelyn M. Johnson with Peet. *Master's thesis*.
- 1938 Operating efficiency of household appliances: III. Four electric roasters. Elinor J. Miller with Peet. *Master's thesis*.
- 1939 Some recommended methods for testing performance of electric roasters. Gertrude Berg with Peet. *Master's thesis*. *Publication*:  
Performance of electric roasters. Faith Madden and Peet. Iowa Sta. Res. Bul. 282. 1940.
- 1939 Performance of ice refrigerators: Certain factors influencing storage of foods. Virginia E. Berry with Peet. *Master's thesis*. Commercial grant.
- 1940 Effect of shape and thickness of beater blades of small electric mixers upon certain food products. Lyle M. Mamer with Peet. *Master's thesis*. *Publication*:  
A test of the performance of portable electric mixers for household use. Peet, Gail Redfield, A. E. Baragar. Iowa Sta. Res. Bul. 346. 1946. (Iowa, Purdue, Nebraska cooperating)
- 1940 Effect of agitator and tub design on cleaning action of washers. Gladys Johnson with Peet. *Master's thesis*. *Publication*:  
The cleaning action of washers in relation to agitator and tub design. Jour. Home Econ. 33(5). 1941.
- 1941 Performance of certain combination range ovens. Arlean Pattison with Peet. *Master's thesis*. *Publication*:  
Performance of combination range ovens. Jour. Home Econ. 35(3). 1943.
- 1941 Adequate methods of lighting a home, using liquid fuels. Marion R. Pratt with Peet. *Master's thesis*. *Publication*:  
Lighting the home with liquid fuels. Peet and Koch (Pratt). Jour. Home Econ. 36(6). 1944.
- 1941 Abrasive effect of certain commercial cleaning powders and pastes on porcelain enamel surfaces. Evelyn Sparks with Peet. *Master's thesis*. *Publication*:  
Household cleaning powders do scratch porcelain enamel. The Enamelist 19(3). 1941.
- 1941 Test methods for range ovens: I. Effect on performance of varying the food load in an oven, using baking-powder biscuits. Margaret B. Doughty with Peet. *Master's thesis*.
- 1941 Test methods for range ovens: II. Effect of temperature and load on the browning of a food product in a gas-range oven. Anna L. Wood with Peet. *Master's thesis*.
- 1941 A precise method for determining efficiency of electric-range units. Margaret Woodrow with Peet. *Master's thesis*.
- 1942 Handbook of techniques for effective home-service demonstration. Mary B. Allgood with Peet. *Master's thesis*. *Publication*:  
Demonstration techniques. Prentice-Hall Inc. 1947.
- 1942 Effect of added rotations of the bowl on an electric mixer on certain food products. Helen V. Johnson with Peet. *Master's thesis*.

- 1944 Effect of storage temperature and time on palatability of frozen fruits and vegetables: Subproject I. Investigations of temperature requirements for maintaining quality of frozen foods during short-period storage in household refrigerators. Ruth Mackley with Peet. *Master's thesis*. Cooperative with BHNHE.
- 1947 Acceptability of combination dry and steam flatirons. Harriet Breck-enridge with Peet. *Master's thesis*. *Publication*:  
Combination dry and steam flatirons tested. *Jour. Home Econ.* 40(3). 1948.
- 1947 Effect of temperature fluctuations in home freezers on certain stored foods. Priscilla Turner Cobb with Peet. *Master's thesis*. Cooperative with BHNHE.
- 1948 Weight losses and palatability of beef muscles cooked in a conven-tional saucepan and in a pressure saucepan. Margaret L. DeAtley with Florence Ehrenkranz. *Master's thesis*. *Agr. Exp. Sta. Publication*:  
Temperature-measuring devices for meat cooked in a pressure sauce-pan. *Jour. Home Econ.* 41(8). 1949.
- 1948 Palatability of ground beef and ground pork stored in home freezers at varying temperatures. Virginia E. Hirschbeck with Ehrenkranz. *Master's thesis*. Cooperative with BHNHE. *Publications*:  
Temperature of ice and food in a home freezer. Ehrenkranz, Hirsch-beck, Margaret I. Marron. *Refrig. Engin.* 57(8). 1949.  
Stored foods in a home freezer operated at fluctuating temperature. Ehrenkranz, Roberts, Ross. *Jour. Home Econ.* 44(6). 1952.
- 1948 Effect of temperature fluctuations in home freezers upon stored straw-berries, snap beans, ground beef, and ground pork. Margaret I. Marron with Ehrenkranz. *Master's thesis*. Cooperative with BHNHE. *Publication* (see project above)
- 1949 Operational characteristics and labor requirements of electrical service, equipment, and appliances for the farm home. Ehrenkranz. *Agr. Exp. Sta.* with BHNHE. *Publications*:  
Demand and diversity of use of electricity on 16 farms in eastern livestock area of Iowa. L. B. Altman, Jr., Kathryn Philson, E. J. Buresh. *Iowa Sta. Res. Bul.* 387. 1952.  
Sixteen farm families watch electric use. Altman, Ehrenkranz. *Iowa Farm Sci.* 6(10). 1952.
- 1949 Effect of packaging and judging procedures on scores of ground pork and beef stored at fluctuating temperatures in a home freezer. Lydia Inman with Ehrenkranz. *Master's thesis*. Cooperative with BHNHE.

## Kansas State College

### Housing

- 1938 Negro housing in Manhattan, Kansas. Geraldine J. Hurd with Myrtle A. Gunselman. *Master's thesis*.
- 1939 Certain factors determining the house plans for three home-manage-ment houses at Kansas State College of Agriculture and Applied Science. Vera M. Ellithorpe with Tessie Agan and Ruth Lindquist. *Master's thesis*.
- 1945- Farm-family needs and preferences for housing in Dickinson county,  
1946 Kansas: kitchen and related areas. Agan. *Agr. Exp. Sta.*
- 1947 Certain storage requirements for families with preschool children. Rogenia Green with Agan. *Master's thesis*. (Mimeograph)

- 1948 Space and equipment required for a preschool child's room in a professional family home. Virginia Y. Trotter with Agan. *Master's thesis. Publication:*  
A room for a preschool child. Jour. Home Econ. 41(1). 1949.
- 1948 Economics of the farm home. Jane W. Barnes. Agr. Exp. Sta. *Publication:*  
House improvements in a rural area. Jour. Home Econ. 43(3). 1951.
- 1948 Certain storage requirements for grooming activities of teen-age rural youth in Harvey county. Hazel Molzen with Agan. *Graduate problem.* (Mimeograph)
- 1948 Farm-family living patterns, activities, and preferences used as a basis for functional designing of farm homes. Agan. Agr. Exp. Sta. Regional cooperative. *Publication* (see Iowa)
- 1949- Housing requirements of Kansas farm families with children. Agan, Barnes. Agr. Exp. Sta.
- 1950 Illustrative materials for working arrangements and correct postural practices in homemaking tasks. Ethyl R. Grady with Agan. *Master's thesis.*

### Equipment

- 1932 Relation of construction to performance in table-top electric stoves. Opal F. Osburne with Mary F. Taylor. *Master's thesis.*
- 1932 Distribution of heat in a particular oven when loaded with a particular substance. Merna M. Monroe with Taylor. *Master's thesis.*
- 1934 Some factors affecting the operation of a domestic gas oven. Dale L. Norris with Taylor. *Master's thesis.*
- 1946 Comparative cost of cooking a month's meals on a gas and an electric stove. Evelyn McCormick with Josephine M. Kremer. *Graduate problem.*
- 1947 Economy of time and energy in the hand-ironing of certain flat pieces. Adele M. Cohen with Agan. *Graduate problem.*

## University of Kentucky

### Housing

- 1939 Survey of home-management houses and building plans for a proposed home-management house. Margaret H. Faulconer. *Master's thesis.*

## Louisiana State University

### Housing

- 1947 A study of the preferences of 51 student veterans and their wives in their choice of home values. Annie R. F. Randle. *Graduate problem.*

## University of Maine

### Housing

- 1947- Space, facility, and structural requirements for homes in the Northeast region. Merna M. Monroe. Agr. Exp. Sta. Regional cooperative. *Publication* (see Cornell)
- 1948- Kinds of working and storage space needed in various rooms of the Maine farm home, and the preferred juxtaposition of the most frequently used rooms. Monroe. Agr. Exp. Sta.
- 1949- Space, facility, and structural requirements for farmhouses in the Northeastern region: Designing of storage space for children's toys and play materials. Monroe. Agr. Exp. Sta. Regional cooperative.

**Equipment**

- 1931- Economic utilization of electricity in food preparation in Maine rural homes. Lolie Smith. Agr. Exp. Sta. *Publications*:  
 1933 A study of factors of economy in electrical cooking of a typical day's meals in Maine. Maine Sta. Bul. 371. 1934.  
 Thermal efficiency of cooking utensils as affected by variations in the area of their contact with the heating surfaces. Monroe, Smith. Jour. Home Econ. 26(1). 1934.
- 1933- Economic utilization of electricity in food preparation in Maine rural homes. Monroe. Agr. Exp. Sta. *Publications*:  
 1942 A primer of electricity and heat. Maine Sta. Bul. 376. 1934.  
 Introducing the electric range. Monroe, Edna Cobb. Maine Ext. Bul. 222. 1936.  
 Evaluation of certain factors affecting the cost of using utensils on electric heating units. Maine Sta. Bul. 386. 1937.  
 Effect of steam on the baking of foods. Jour. Home Econ. 36(2). 1944.
- 1935- Economical management of kerosene cookstoves to secure palatability of product in Maine farm households. Monroe. Agr. Exp. Sta. *Publications*:  
 1937 Buying and using kerosene stoves. Monroe, Cobb. Maine Ext. Bul. 251. 1938.  
 Performance analysis of selected types of kerosene stoves. Maine Sta. Bul. 394. 1939.
- 1938- Performance of wood ranges heated by distillate burners and an evaluation of factors which affect this performance. Monroe. Agr. Exp. Sta. *Publication*:  
 1941 Kerosene burners in a wood cookstove. Maine Sta. Bul. 433. 1945.
- 1940- Testing of 1939-1940 models of electric ranges sold in this territory.  
 1941 Monroe. Agr. Exp. Sta. *Publication*:  
 Equipment for electrical cookery. Monroe, Cobb. Maine Ext. Bul. 293. 1941.
- 1946- Testing pressure saucepans. Monroe. Agr. Exp. Sta. *Publication*:  
 1947 Concerning pressure saucepans. Maine Sta. Bul. 455. 1947.
- 1947- Evaluation of different styles of kitchen sinks. Monroe. Agr. Exp. Sta. *Publication*:  
 1949 Ideas to consider when you buy a kitchen sink. Maine Sta. Bul. 494. 1951.

**Housing****Michigan State College**

- 1947 Functional use of rooms in farm dwellings. Irma H. Gross, Alice C. Thorpe. Agr. Exp. Sta. *Publication*:  
 Family use of farm homes: Study of activities carried on by and preferences of family members. Mich. Sta. Bul. 227. 1952.

**Housing****University of Minnesota**

- 1936 A study of the housing of 316 master farm homemakers, with special reference to adequacy. Paulena Nickell. *Ph.D. thesis*.
- 1947- Determination and interpretation of farmhouse requirements based upon patterns of farm-family living; and the development of plans, construction practices, and effective methods for attaining adequate economical housing for farm families. Agr. Exp. Sta. Regional co-operative. Marguerite Paulsen. *Publication (see Iowa)*

**Equipment**

- 1946 Effect of fluctuating storage temperature on quality of stored food. J. D. Winter, Andrew Hulstrulid, Isabel Noble. Agr. Exp. Sta. with BHNHE. *Publication*:

(Same title as project) Winter, Hulstrulid, Noble, Enid Sater Ross. Food Tech. 6(8). 1952.

**Housing****Mississippi State College**

- 1948 Functional requirements and plans for Southern rural homes. Dorothy Dickens. Agr. Exp. Sta. Regional cooperative. *Publications*:

The farm home improves its equipment. Jour. Home Econ. 40(10). 1948.

Housing of farm owner-operator families in the Mississippi lower central area. Miss. Sta. Bul. 490. 1952. (See also Georgia)

**Housing****University of Missouri**

- 1940 Housing conditions of 750 rural rehabilitation families of the Farm Security Administration in Missouri. Bonnie L. Barrick. *Master's thesis*.
- 1947 Farm-family needs and preferences. Kenneth B. Huff. Agr. Exp. Sta. Regional cooperative. *Publication* (see Iowa)

**Housing****Montana State College**

- 1947 Environmental factors affecting housing. Gloria Cooper, Martha Wright. Agr. Exp. Sta. Regional cooperative.
- 1948 Improvement of rural housing in the Western region: A study to determine functional requirements. Katherine Roy. Agr. Exp. Sta. Regional cooperative. *Publication* (see BHNHE)
- 1949- Sewing centers. Margaret Slaughter, Evelyn McCormick, Velma Williams. Agr. Exp. Sta. Regional cooperative.
- 1949- Personal hygiene areas. Slaughter. Agr. Exp. Sta. Regional cooperative.

**Equipment**

- 1948 A study of small pressure saucepans to determine efficiency of gauges, fuel consumption, and cooking time necessary. Alma R. Ragar. Commercial grant.

**Housing****University of Nebraska**

- 1925- \*Lighting of Nebraska rural homes by kerosene and gasoline lamps.
- 1928 Greta Gray. Agr. Exp. Sta. *Publication*:
- (Same title as project) Neb. Sta. Bul. 225. 1928.
- 1925- Water carried for household purposes on Nebraska farms. Gray.
- 1929<sup>6</sup> Agr. Exp. Sta. *Publication*:
- (Same title as project) M. Ruth Clark, Gray. Neb. Sta. Bul. 234. 1929.
- 1926- The Nebraska farm kitchen. Gray. Agr. Exp. Sta. *Publication*:
- 1928 (Same title as project) Neb. Sta. Bul. 226. 1928.

\* Also included under equipment in statistical studies.

- 1940- \*Improvement of the lighting of farm homes without electricity. A. E.  
1950 Bargar. Agr. Exp. Sta. (Mimeograph)
- 1946- \*A study of the use of kitchen utensils, menus, and home food prac-  
1948 tices in farm communities. Baragar, Esther Herrmann. Agr. Exp. Sta.  
with BHNHE and California and Rhode Island Stations. *Publications*  
(see other institutions).
- 1947 Some characteristics of farm housing in Nebraska, 1940. Louise Wind-  
husen with Margaret Liston. *Master's thesis*.
- 1947- Activities, possessions and verbal preferences of Nebraska farm fami-  
lies which may influence their housing needs. Virginia Trotter, Liston,  
Herrmann. Agr. Exp. Sta.
- 1947 Determination and interpretation of farm-house requirements based  
upon patterns of farm-family living and the development of plans,  
construction practices and effective methods for attaining adequate  
economical housing for farm families. Liston, Herrmann. Agr. Exp.  
Sta. Regional cooperative. *Publication* (see Iowa)

### Equipment

- 1926- Kerosene stove study. Edna B. Snyder. Agr. Exp. Sta. *Publication*:  
1930 A study of kerosene cook stoves. Neb. Sta. Res. Bul. 48. 1930.
- 1928- Washing machine study. Snyder. Agr. Exp. Sta. *Publication*:  
1931 A study of washing machines. Snyder, Morton Brunig. Neb. Sta.  
Res. Bul. 56. 1931.
- 1930- Factors affecting the performance of kerosene cook stoves. Snyder.  
1932 Agr. Exp. Sta. *Publication*:  
(Same title as project) Neb. Sta. Res. Bul. 64. 1932.
- 1931- Study of electric stoves. Baragar, Snyder. Agr. Exp. Sta. *Publica-*  
1933 *tion*:  
A study of five commercial electric stoves. Neb. Sta. Res. Bul. 68.  
1933.
- 1933- Performance of selected types of gas stoves. Baragar. Agr. Exp. Sta.  
1938 *Publications*:  
A study of selected types of domestic gas stoves. Neb. Sta. Res.  
Bul. 86. 1936.  
Selecting your gas stove. Neb. Sta. Cir. 55. 1937.  
Further studies of selected types of domestic gas stoves. Neb. Sta.  
Res. Bul. 111. 1939.
- 1935- Steam pressure cookers used in Nebraska homes. Baragar. Agr. Exp.  
1938 Sta. *Publications*:  
The accuracy of pressure gauges used on household steam pressure  
cookers. Neb. Sta. Res. Bul. 99. 1938.  
Your pressure cooker. Neb. Sta. Cir. 57. 1938.
- 1937- Study of pressure gasoline and kerosene stoves. Baragar. Agr. Exp.  
1944 Sta. *Publications*:  
An analysis of pressure gasoline and pressure kerosene stoves. Neb.  
Sta. Res. Bul. 127. 1942.  
Pressure gasoline and pressure kerosene stoves. Neb. Sta. Cir. 70.  
1942.
- 1937- Performance of portable electric mixers for household use. Baragar.  
1946 Agr. Exp. Sta. *Publication* (see Iowa, 1940)

\* Also included under equipment in statistical summaries.



- 1944— Performance of coal and wood ranges for cooking and heating as a  
 1950 function of design and methods of operation. Baragar. Agr. Exp. Sta.  
 1947— Performance of home pasteurizers for milk and cream. Baragar. Agr.  
 1948 Exp. Sta. *Publication*:  
     Portable electric milk pasteurizers. Neb. Sta. Res. Bul. 157. 1948.  
 1947— Liquid loss from glass jars processed in the pressure cooker. Baragar.  
 1949 Agr. Exp. Sta. *Publication*:  
     (Same title as project) Neb. Sta. Res. Bul. 163. 1949.  
 1950— Development of test methods for evaluating the performance of  
     household vacuum cleaners. Agr. Exp. Sta. Baragar.

**Housing****Rutgers University (New Jersey)**

- 1947— Farm-housing requirements in the Northeast region, H. E. Besley.  
 1949 Agr. Exp. Sta. Regional cooperative. *Publication* (see Cornell)

**Equipment****Columbia University<sup>a</sup> (New York)**

- 1947— Cleaning methods and equipment used in 25 New Jersey homes.  
 1948 Elaine K. Weaver. Commercial grant.

**Housing****Cornell University (New York)**

- 1928 Organization of the sewing center in the home. Ella M. Cushman with  
     Martha Van Rensselaer and Dexter S. Kimball. *Master's thesis. Pub-*  
     *lication*:  
     (Same title as project) Cushman. N.Y. (Cornell) Sta. Bul. 492. 1929.  
 1934— Farm houses studied as centers for family living: 143 farm houses  
 1935 in New York State, 1931. Ruth Palmer with Day Monroe. *Master's*  
     *thesis*.  
 1935 Consideration of the needs of children in selecting household furnish-  
     ings, as determined by a study of 55 families in Ithaca, New York.  
     Delpha E. Wiesendanger with Helen Canon and Ethel Waring.  
     *Master's thesis*.  
 1938 Kitchen storage spaces in relation to management. Clara E. Jonas  
     with Canon and Cushman. *Master's thesis. Publication*:  
     Kitchen storage space. Jonas. N.Y. (Cornell) Ext. Bul. 398. 1938.  
 1938 Efficiency in the arrangement of equipment and materials for the per-  
     formance of a common task in food preparation. Louise E. Greer  
     with Canon and Cushman. *Master's thesis*.  
 1940 Determination of the most satisfactory methods of maintaining felt-  
     base floor coverings in home kitchens. Evelyn K. Bennett with Cush-  
     man, Canon, and Lucille J. Williamson. Agr. Exp. Sta. *Master's*  
     *thesis. Publication*:  
     Linoleum and felt-base floor coverings: selection and care. Bennett.  
     N. Y. (Cornell) Ext. Bul. 610. 1943.  
 1940— Major equipment, work space, and storage space found in 160 farm  
 1941 and village homes in New York State. Mildred Spicer with Canon  
     and Cushman. Agr. Exp. Sta. *Ph.D. thesis*.

<sup>a</sup> Teachers' College.

- 1940- Posture and other physiological responses of the worker in relation to  
1944 the height of working surface used in household ironing. Elaine Knowles with Canon and Cushman. Agr. Exp. Sta. *Ph.D. thesis. Publication:*  
Some effects of the height of ironing surface on the worker. Knowles. N.Y. (Cornell) Sta. Bul. 833. 1946.
- 1944- Functional kitchen storage. Mary K. Heiner and Helen E. McCul-  
1946 lough. Commercial grant and Agr. Exp. Sta. *Publications:*  
A new look at the kitchen. Arch. Forum 84 (2 and 3). 1946.  
Kitchen cupboards that simplify storage. N.Y. (Cornell) Ext. Bul. 703. 1947.  
(Same title as project) N.Y. (Cornell) Sta. Bul. 846. 1948.
- 1945- \*Relation of sink dimensions to posture of the worker. Williamson,  
1947 Esther Crew, Catherine Behnke. Agr. Exp. Sta.
- 1946- Variations in dimensions and weights of consumer packages (from  
1949 home storage point of view). Dorothy E. Stockburger and Dorothy Klitzke with Mabel A. Rollins. Agr. Exp. Sta. *Master's thesis.*
- 1946 A study of farm housing in Courtland county, N. Y., to determine extent and type of new and remodeled housing to be undertaken in the immediate postwar period. Grace Morin, S. Holt, T. Baird.
- 1946 Analysis of farm housing and related economic and social factors, for New York State and the rural counties of the state. Morin.
- 1946 Development of an educational instrument to reveal personal and family values in the choice of a home. Virginia F. Cutler with Asahel D. Woodruff. *Ph.D. thesis. Publications:*  
Personal and family values in the choice of a home. Cutler. N.Y. (Cornell) Sta. Bul. 840. 1947.  
Make it your house (*with supplement: Home values test for family members*). Cutler. N.Y. (Cornell) Ext. Bul. 718. 1947.
- 1947- Development of a functional basis for kitchen designing. Mary K.  
Heiner, Rose Steidl. Agr. Exp. Sta. *Master's thesis* (relationship of the work areas as a criterion for functional kitchen design), Steidl. 1949. *Publications:*  
Guides for arrangement of urban family kitchens. N.Y. (Cornell) Sta. Bul. 878. 1951.  
Let your kitchen arrangement work for you. N.Y. (Cornell) Ext. Bul. 814. 1951.
- 1947- Farm housing requirements in the Northeast region. G. H. Beyer.  
1949 Agr. Exp. Sta. Regional cooperative. *Publication:*  
Farm housing in the Northeast. N.Y. (Cornell) Sta. Mem. 292 (NE Reg. Pub. 1). 1949.
- 1948- Study of component activities common to certain major household  
1949 tasks (in relation to design of household equipment). Esther Crew (Bratton) with Canon and Williamson. Agr. Exp. Sta. *Ph.D. thesis. Publication:*  
Oxygen consumed in household tasks. Bratton. N.Y. (Cornell) Sta. Bul. 873. 1951.
- 1948 Housing requirements and house improvement practices of rural families in five selected areas of New York State. G. H. Beyer. Agr. Exp. Sta. *Publication:*

\* Also included under equipment in statistical summaries.

Rural housing in New York State: an economic study of five counties. N.Y. (Cornell) Sta. Bul. 893. 1952.

- 1949- Determination of space requirements for meal preparation. Beyer. Agr. Exp. Sta. Regional cooperative.
- 1949- Influence of economic level and type of resident upon housing situa-  
1950 tion of rural families in Monroe county, New York. Martha J. Wright. *Master's thesis*.
- 1949- Basic distances in 100 farm homes for preparing and serving food and  
1950 washing dishes. Clara Ridder with Canon. Agr. Exp. Sta. *Ph.D. thesis*. *Publication*:  
(Same title as project) N.Y. (Cornell) Sta. Bul. 879. 1952.
- 1950- Farmhouse storage facilities for food commodities and related equip-  
ment. Beyer, Heiner, O. C. French. Agr. Exp. Sta.
- 1950 Farmhouse planning in New York State. Morin. *Publication*:  
(Same title as project) N.Y. (Cornell) Misc. Bul. 10. 1951.

## Equipment

- 1935- Small kitchen equipment used by 160 young families, Ithaca, New  
1936 York. Caroline G. Pringle with Canon and Cushman. Agr. Exp. Sta. *Master's thesis*. *Publication*:  
A useful supply of kitchenware. N.Y. (Cornell) Ext. Bul. 357. 1936.
- 1944 Effect of fluctuating storage temperatures on the quality of stored  
frozen foods. Willis Gortner. Cooperative with BHNHE. *Publication*:  
Effect of fluctuating storage temperatures on quality of frozen foods.  
Gortner, Faith Fenton, Frances E. Volz, and Ella Gleim. Indus.  
and Engin. Chem. 40(8). 1948.

## Syracuse University (New York)

### Housing

- 1942 Electrical service in homes in Wichita, Kansas. Jeanette Stearns.  
*Master's thesis*.
- 1944 Public housing as a vocational objective for home economics. Margaret  
A. Cain. *Master's thesis*.
- 1944 Survey of homemakers' preferences in postwar homes and equipment.  
Helen J. Miller. *Graduate problem*. *Publication*:  
Postwar homes as women want them. Prudence S. Connor, Helen  
M. Seyse. What's New in Home Econ. 10(1). 1945.
- 1945 A study of families vacating a public housing project in 1945 as a  
basis of education for improving home and family life. Elizabeth S.  
Herbert. *Master's thesis*.
- 1947 A study of housekeeping efficiency in dwelling units of a public  
housing project. Virginia T. Salisbury. *Master's thesis*.

### Equipment

- 1945 A study concerning women's knowledge of their electric equipment  
based on 100 families in Syracuse in 1944. Seyse. *Master's thesis*.  
*Publication*:  
Extent of information about electric equipment. Connor, Seyse, Lila  
Thurston. Jour. Home Econ. 38(6). 1946.
- 1949 Survey of available information on technical features of four major  
household appliances: Electric and gas ranges, electric refrigerators,  
and home freezers. Mary N. Alexander. *Master's thesis*.
- 1950 Adequacy of consumers-buyers' information related to automatic  
washers. Yvonne Horton. *Master's thesis*.

## University of North Carolina Woman's College

### Housing

- 1939 Housing and equipment provided for young children in the homes of members of parent education study groups. Lorena E. Rogers. *Master's thesis.*
- 1944 Changes in the design of selected articles of living room furniture in the United States, Jan.-Dec. 1943. Elizabeth T. White. *Master's thesis.*
- 1949 Factors influencing the purchase of upholstered furniture and the resulting satisfactions as expressed by fifty homemakers. Mary C. Miller. *Master's thesis.*
- 1950 Evaluation of the dining areas in thirty families. Catherine Campbell. *Master's thesis.*
- 1950- Housing needs of preschool children in towns in the Piedmont area of North Carolina. Josephine Kremer, Louise Edwards. Agr. Exp. Sta. *Master's thesis.*
- 1950- Space and storage requirements for home activities of children. Group 1: preschool children. Kremer, Savannah Day. Agr. Exp. Sta. Regional cooperative.

## Ohio State University

### Housing

- 1926 The information of a group of 100 homemakers concerning certain principles of house construction and furnishings as shown by replies to a questionnaire. Isabelle M. Hitchcock. *Master's thesis.*
- 1937 \*Specifications of small equipment for the foods laboratory of the home economics department of a high school of 125 pupils. Dorothy Bowers. *Master's thesis.*
- 1942 \*Home lighting conditions in a selected group of farm homes. Mary E. Barnes. *Master's thesis.*
- 1947 Farm-family needs and preferences for housing. Elaine K. Weaver, Tynii Niemi. Agr. Exp. Sta. Regional cooperative. *Publication (see Iowa)*
- 1948- Housing preferences of 84 rural Ohio Families. Niemi. *Master's thesis.*
- 1949 Home-management aids for women with physical limitations. Julia S. Judson. *Master's thesis. Publication:*  
The physically handicapped and kitchen operation. Kitchen Rptr. Jan. 1950.
- 1949 \*A study in home lighting. Norma J. Round. *Master's thesis.*
- 1950 Space needs for sewing activities in 50 rural homes, Bostic, N. C. Grace Hollifield. *Master's thesis. Publication:*  
A place to sew. Pract. Home Econ. 28(8). 1950.
- 1950 Housing preferences and problems of a selected group of people, 50 years of age and over, Harding county, Ohio, 1950. Nettie Barker. *Master's thesis.*
- 1950 Determination of suitable work-surface materials and finishes used in rural homes from the standpoint of maintenance, durability, and cost. Weaver. Agr. Exp. Sta. Regional cooperative.

\* Also included under equipment in statistical summaries.

**Equipment**

- 1933 Some characteristics of homemade ice cream made from cream of varying butterfat content and frozen in the automatic refrigerator. Ruth Beard. *Master's thesis*.
- 1943 Dishwashing machine: The sanitation of eating utensils. Helen B. Rupp. *Master's thesis*.
- 1946 Freezing preservation of pies. Esther Scheedegeer. *Master's thesis*.
- 1948-1949 Use of various new types of washing machines for laundering in rural homes. Weaver. Agr. Exp. Sta. *Publication*:  
A study of the use of three types of automatic washers. Ohio Sta. Res. Bul. 715. 1951.
- 1949 Study of blanket laundering in automatic washers. Martha A. Plonk. Agr. Exp. Sta. Commercial assistance. *Master's thesis*. *Publication*:  
Laundering of blankets in automatic washers and dryers. Weaver, Plonk, Marea F. Bordt. Ohio Sta. Res. Bul. 717. 1952.
- 1949 Some effects of automatic home dryers on wool blankets. Bordt. Agr. Exp. Sta. Commercial assistance. *Master's thesis*. *Publication* (see above)
- 1950 Study of certain frozen foods stored in two types of domestic refrigerators. Marion Wilt Morton. Commercial assistance. *Master's thesis*.
- 1950 Study of household equipment articles published by ten women's magazines. Mary E. Watt. *Master's thesis*.

**Ohio University****Housing**

- 1942 Study of certain storage areas of the newly remodeled home-management house of Ohio University. Nancy Caughey. *Master's thesis*.

**Oklahoma A & M****Housing**

- 1949 Master bedroom storage in rural homes of Oklahoma. Elaine Barber. *Master's thesis*.
- 1950 Houseplans for a paraplegic. Lula Darnell. *Master's thesis*.
- 1950 Organized storage for a specific family. Mary A. Carroll. *Master's thesis*.
- 1950 Storage of sewing equipment to form a home sewing center. Margaret Combs. *Master's thesis*.

**Oregon State College****Housing**

- 1930-1932 The farm home (an analysis of housing requirements). Maud Wilson. Agr. Exp. Sta. *Publication*:  
Planning the Willamette Valley farmhouse for family needs. Ore. Sta. Bul. 320. 1933.
- 1933-1944 Standardization of dimensions of space units in the dwelling. Wilson and Helen E. McCullough. Agr. Exp. Sta. *Publications*:  
Standards for working-surface heights and other space units of the dwelling. Evelyn H. Roberts, Wilson, Ruth Thayer. Ore. Sta. Bul. 348. 1937. (Also published by Wash. Sta.)  
The Willamette Valley farm kitchen. Wilson. Ore. Sta. Bul. 356. 1938.

Planning the kitchen. Wilson. Ore. Sta. Cir. 131. 1939.  
Closet and storage space. USDA Farmer's Bul. 1865. 1940. (Subject matter by Wilson and J. Robert Dodge; arranged and written by Elma Edwards)

- 1937- Housing requirements of 50 selected families, Spokane, Wash. Anna  
1938 C. Mikkelson. *Master's thesis*.
- 1938 Planning the family dwelling for a Willamette Valley village. Wilma  
Rondeau. *Master's thesis*.
- 1938 Heights for high-school clothing-laboratory tables based on measure-  
ments of 100 girls. Mary E. Stayton with Vera Brandon. *Master's  
thesis*.
- 1938- Arrangements needed for home storage of preschool children's play  
1939 materials. Esther Kammerer. *Master's thesis*.
- 1939 Housing needs of renting families and available renting facilities in  
Ontario, Oregon. Ruth Chindgren. *Master's thesis*.
- 1939 Recommendations for planning a home-management house for Ore-  
gon State College, based on a study of needs. Elizabeth Cameron.  
*Master's thesis*.
- 1939- Study of the kitchen sink center in relation to home management.  
1940 Mabel Mack. *Master's thesis*.
- 1939 Housing arrangements from the standpoint of family needs. Maud  
Wilson and Laura Wells. Agr. Exp. Sta. *Publications*:  
Housing requirements of the farm families in the United States.  
USDA Misc. Pub. 322. 1939.  
House planning ideas of Oregon rural women. Ore. Sta. Bul. 369.  
1940.  
A set of utensils for the farm kitchen. Wilson, McCullough. Ore.  
Sta. Cir. 134. 1940.
- 1940 Storage facilities for personal belongings in the home-management  
house. Rheta Morrison. *Master's thesis*.
- 1941- Standardized farm house plans. Wilson, H. R. Sinnard. Agr. Exp.  
1945 Sta. *Publication*:  
Plans for Oregon farm and acreage homes: A handbook for extension  
workers. Ore. Sta. 1945.
- 1941 Dimensions standards for a high-school foods laboratory. Doris I. An-  
derson with Florence E. Blazier. *Master's thesis. Publication*:  
The unit kitchen. Blazier. Pract. Home Econ. 24(7). 1946.
- 1941 Planning a combination homemaking room for a Monterey, California,  
school. Maurine Van der Griend with Blazier. *Master's thesis. Pub-  
lications*:  
Planning a combination homemaking room. Amer. School Bd. Jour.  
108(2). 1944.  
Planning a combination homemaking room. Blazier. Forecast 60(5).  
1944.
- 1942 Survey of the room-improvement and other household-administration  
4-H Club projects in the United States, Hawaii, and Puerto Rico.  
Verna A. Coates. *Graduate problem*.
- 1942 \*Determining a standard set of utensils for a high-school home-labora-  
tory. Ardythe W. Dougherty with Blazier. *Master's thesis*.

\* Also included under equipment in statistical summaries.

- 1942 Opinions of home-economics leaders concerning locating, arranging, and equipping homemaking departments. Justine O'Reilly with Blazier. *Master's thesis*.
- 1942 Factors in designing a home-management house for the Oregon State Campus. Harriet Sinnard. *Master's thesis*.
- 1942 Evaluation by homemakers of specific building features of selected houses. Owner-built for their own occupancy. Amelia Sansom. *Master's thesis*.
- 1942 Analysis of housing needs of migrant people near Modesto, California. Helen G. Meadowcraft. *Master's thesis*.
- 1942 \*Recommendations for a standard set of kitchen utensils for a home-management house in Oregon State College. Gladys Hedlund. *Master's thesis*.
- 1943 Laboratories, equipment, and practices used in teaching foods in Oregon high schools, 1940. Alta Hirst with Blazier. *Master's thesis*. *Publication*:  
     Planning homemaking rooms. Jour. Home Econ. 37(8). 1945.
- 1944- Postwar farmhouse planning. Maud Wilson. Agr. Exp. Sta. *Publications*:  
 1946  
     Considerations in planning kitchen cabinets. Ore. Sta. Bul. 445. 1947.  
     Patterns for kitchen cabinets. Ore. Sta. Bul. 446. 1947.  
     A guide for the kitchen planner. Ore. Sta. Bul. 482. 1950.
- 1945- Use of electricity in Oregon rural homes. Wilson, Sara Shively. Agr.  
 1949 Exp. Sta. *Publications*:  
     Planning a center for hand ironing. Ore. Sta. Cir. 179. 1949.  
     (Same title as project) Jour. Home Econ. 39(6). 1947.
- 1946- Storage facilities for other areas of farmhouses than the kitchen.  
 1950 Wilson. Agr. Exp. Sta.
- 1946 Optimal storage in the unit kitchen. Commery Coleman with Blazier. *Master's thesis*.
- 1946 Housing arrangements affecting home management when preschool children are included. Helen H. Zimmer with Vera Brandon. *Master's thesis*.
- 1947 Storage requirements for the possessions of children in Wyoming rural homes. Pauline Bunting. *Master's thesis*.
- 1947- Improvement of rural housing in the Western region. Wilson. Agr.  
 1949 Exp. Sta. Regional cooperative. *Publication* (see BHNHE)
- 1950- Space requirements for reading. Wilson, Maurine Blackwell. Agr.  
 Exp. Sta. Regional cooperative.
- 1950 Evaluation of fifteen homemaking departments in Oregon based on the Blackwell rating scale. Helen L. Hollandsworth with May DuBois. *Master's thesis*.
- 1950 \*Recommended equipment for teaching a four-year homemaking program in Oregon secondary schools. Eleanor Brunquist with DuBois. *Master's thesis*.

\* Also included under equipment in statistical summaries.

## Pennsylvania State College

### Housing

- 1947 Housing requirements of Pennsylvania farm families. Francena Nolan, Ruth Honey, Christine Salmon, Delpha E. Wiesendanger, M. E. John, Gladys Wasmuth. Agr. Exp. Sta. *Publication*:  
Family housing in owner-operated farms in Pennsylvania. Nolan, Honey, Wasmuth. Penn. Sta. Bul. 534. 1950.
- 1947- Space facility, and structural requirements for houses in the North-  
1949 east region. Nolan, Honey, Salmon, Wiesendanger, D. C. Sprague, H. V. Walton. Agr. Exp. Sta. Regional cooperative. *Publications*:  
Adjustable walls for space study. Nolan, Sprague. Penn. Sta. Prog. Rpt. 43. 1951.  
A daylight projector for motion study analysis. Nolan, L. P. Greenhill, W. Kjelgaard. Penn. Sta. Prog. Rpt. 62 (Home Econ. Res. Pub. 109) 1951.  
(See also Cornell)
- 1949- Space, facility, and structural requirements for farmhouses in Penn-  
sylvania. Nolan, Honey, Wiesendanger, Sprague, Walton, Salmon. Agr. Exp. Sta.
- 1949- Some ways children's activities and attitudes affect housing require-  
1950 ments of families on 188 owner-operated farms in Pennsylvania. L. Jeanne Riebel. *Master's thesis*.
- 1949 Space, facility, and structural requirements for farmhouses in the  
Northeast region. (Space requirements for laundry and sewing)  
Nolan, Honey, Wiesendanger, Salmon, Sprague, Walton. Agr. Exp. Sta. Regional cooperative.

### Equipment

- 1944 Performance and rate of freezing of food in a farm freezer. Mary M. Wylie. *Master's thesis*.
- 1944 Performance of a domestic frozen-food cabinet. Gertrude C. Simpson. *Master's thesis*.

## University of Rhode Island

### Housing

- 1935 Home floor finishes. Blanche M. Kuschke. Agr. Exp. Sta. *Publication*:  
Wood finishes. R. I. Misc. Pub. 3. 1939. (*Rev. as* Home floor finishes, 1947)
- 1940 Care and maintenance of wood floor finishes in the home. Kuschke. Agr. Exp. Sta. *Publication*:  
(Same title as project) R. I. Sta. Bul. 276. 1940.
- 1945 Floor finishes as affected by soles and heels of wartime shoes. Kuschke. Agr. Exp. Sta. *Publication*:  
Floor finishes as affected by composition soles and heels of wartime shoes. R. I. Misc. Pub. 22. 1945.
- 1946 \*Study of the use of kitchen utensils, menus, and home food practices in farm communities. Kuschke, Grace H. Smith. Agr. Exp. Sta. with BHNHE and California and Nebraska Stations. *Publication*:  
The use of kitchen utensils in rural Rhode Island homes. R. I. Sta. Bul. 304. 1949.  
(See also California)

\* Also included under equipment in statistical summaries.



- 1947 Space, facility, and structural requirements for homes in the North-east region. Kuschke. Agr. Exp. Sta. Regional cooperative. *Publication* (see Cornell)
- 1948-1948 Rhode Island farmhouses. Kuschke, Smith. Agr. Exp. Sta. *Publication*:  
(Same title as project) R. I. Sta. Bul. 307. 1950.
- 1949 Home floors in Rhode Island. Kuschke. Agr. Exp. Sta. *Publication*:  
(Same title as project) R. I. Misc. Pub. 39. 1949.
- 1949 Relationship of activities and space arrangements for the social and recreational needs of the family. Agr. Exp. Sta. Regional cooperative. *Publication*:  
Rhode Island rural housing and family leisure. Ethyl R. Grady, Smith, Kuschke. R. I. Sta. Bul. 318. 1952.

### Equipment

- 1933 Home refrigeration methods used in rural Rhode Island. Kuschke, Margaret Whittemore. Agr. Exp. Sta. *Publication*:  
(Same title as project) R.I. Sta. Bul. 239. 1933.
- 1938 The efficient pouring utensil. Kuschke, Whittemore. Agr. Exp. Sta. *Publication*:  
(Same title as project) R.I. Sta. Bul. 266. 1938.

## Clemson Agricultural College<sup>1</sup> (S. Carolina)

### Housing

- 1946-1947 A case study of improved rural housing. Ada M. Moser, Elizabeth S. Watson, Eloise Johnson. Agr. Exp. Sta.
- 1947-1949 Household activities and facilities and family housing preferences among farm owners in York county. Moser, Watson. Agr. Exp. Sta.
- 1947-1949 Household activities, facilities, and preferences in the Piedmont and Coastal Plains areas of South Carolina as basis for development of functional farmhouse plans. Watson, Moser. Agr. Exp. Sta. Regional cooperative. *Publication* (see Georgia)

## University of Tennessee

### Housing

- 1938 Storage facilities in fifty homes of Knoxville, Tennessee. Lucy A. Goddard. *Master's thesis*.
- 1941 Living practices, economic status, and housing of 78 families of Huntingdon College students, Montgomery, Ala. Pearl P. Campbell. *Master's thesis*.
- 1947 Functional requirements and plans for Southern rural homes. Josephine Staab, Dorothy Jaques. Agr. Exp. Sta. Regional cooperative. *Publication* (see Georgia)
- 1949 Study of certain storage facilities of selected farm homes as a guide to storage needs. Ruby Craven. *Master's thesis*.
- 1950- Functional requirements and plans for Southern rural homes: An analysis of space requirements for meal service and meal preparation in Southern rural homes. Lorna J. Gassett, Elisabeth L. Speer, M. A. Sharp. Agr. Exp. Sta. Regional cooperative.

<sup>1</sup> Winthrop College.

**North Texas State College****Housing**

- 1941 Survey of housing conditions in Wellman, Texas. Velma McWhirter. *Master's thesis.*
- 1950 Survey of home conditions in Howard county, Texas. Margaret Christie. *Master's thesis.*

**Prairie View State College (Texas)****Housing**

- 1942 Needs of the residents of the D. N. Leathers slum clearance. Olivia W. Hall. *Master's thesis.*

**Texas State College for Women****Housing**

- 1938 Community and home conditions that may be used as a basis in selecting equipment for homemaking department in public schools. Ruby L. Seal with Clara Tucker. *Master's thesis.*
- 1939 Home environments of homemaking students of Texas State College for Women. Myrtle D. Neggy with Ercell Eppright. *Master's thesis.*
- 1940 Use of physical equipment at school and at home by preschool child. Marjorie B. Odom. *Master's thesis.*
- 1940 Housing as taught in a group of selected high schools of Texas. Mary A. M. Stone with Tucker. *Master's thesis.*
- 1950 Relation of physical plant and equipment to certain aspects of homemaking education. Frances Williamson with Johnnie Christian. *Master's thesis.*

**Texas Technological College****Housing**

- 1949 Survey of development of home and family-life education program on Hub Homes Housing Project, with emphasis on the work of the home counselor. Carrie L. Bishop with Vivian J. Adams. *Master's thesis.*

**University of Texas****Housing**

- 1942 Efficiency of 100 small new homes in Austin, Texas, in meeting family needs. Sara Files. *Master's thesis.*

**Utah State Agricultural College****Housing**

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